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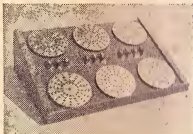
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Astounding SCIENCE FICTION

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Editor: JOHN W. CAMPBELL, JR.

Assistant Editor: KAY TARRANT

Advertising Manager: WALTER J. McBRIDE

COVER BY VAN DONGEN • Illustrations by Freas and van Dangen
SYMBOL: Crystal-liquid interface

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Astounding SCIENCE FICTION published monthly by Street & Smith Publications, Incorporated at 575 Madison Avenue, New York 22, N. Y. Arthur Z. Gray, President; Ralph R. Whittaker, Jr., Executive Vice-President; Arthur P. Lawler, Vice President and Secretary; Robert E. Park, Vice-President and Advertising Director; Thomas H. Kaiser, Treasurer. © 1957 by Street & Smith Publications, Inc., in the United States and countries signatory to the Berne Convention and Pan American Convention. Entered as second-class matter at the Post Office, New York, N. Y. Subscription \$5.50 for one year and \$8.00 for two years in the United States, Possessions and Canada; \$4.75 for one year and \$8.00 for two years in Pan American Union, Philippine Islands and Spain. Elsewhere \$5.00 for one year and \$8.50 for two years. When possible allow four weeks for change of address. Give old address and new address when notifying us. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage. All subscriptions should be addressed to Subscription Dept., Street & Smith Publications, Incorporated, 304 East 45th Street, New York 17, New York.

\$3.50 per Year in U. S. A.

Printed in  173 the U. S. A.

35 cents per Copy

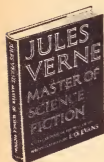
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LEARNING PATTERNS

Psychology is, naturally, strongly concerned with the problem of learning patterns—both at the level of educational psychology, and with the problem of psychotherapy. The latter, particularly, includes the problem of *unlearning*, which is an inherently different process, which has been studied considerably less than the learning process itself.

That unlearning is an inherently different process is indicated by the fairly basic proposition that you cannot possibly *learn*—by the definition of that term—something you *already know*. Abstracting false knowledge, the unlearning process, is a darned sight more difficult than installing knowledge in an unoccupied area of awareness. Somewhat like the difference between the process of drilling a hole in a mass of solid metal, to make room for a desired insert, and that of placing an object on top of a solid mass of metal.

How do you drill a hole in a mass of false information to make room for the insertion of correct information? How do you unteach an individual so that he can be taught?

It might help a lot if we knew

a bit more about the processes of learning. One of the difficulties that the formal psychologist is up against is, of course, that, unlike the editor of a science-fiction magazine, he isn't permitted to publish free-wheeling speculations without reams of logic-and-data proof. That's apt to be quite a handicap if the process he's trying to describe happens to be inherently nonlogical; he'll never get it into logical form, in that case.

One of the typical nonlogical realities—a reality that we can, as human beings, "know" exists, yet cannot present logical proof for—is the simple matter of pattern. The Ishihara Color Vision test, for example; it consists of a disk on which is printed an almost random mass of pastel colored dots of all colors. But not quite random; there may be, for example, a figure 5, perhaps made up of a slightly higher concentration of pinkish pastel dots.

To date, no one has devised any objective, pure-machine device capable of demonstrating the existence of such a pattern. The test of its presence or absence remains on the basis "most people see the figure 5

immediately." The trouble is, the pattern isn't a *logical* structure. It is not true that all the pink dots are in the 5. It is not true that only pink dots are in the 5. It is not true that the pink dots in the 5 are connected. It is true that, if one wishes to, one can draw a figure 5 in black pencil on the pastel dotted card—but that's something you put there; you haven't shown that there originally was any such logical structure.

But any human being with normal vision will spot that 5 immediately. If he happens to be red-green color blind, he won't spot that . . . but he will spot a figure 2, which the man of normal vision can see only after studying the test card for a while.

Try, sometime, proving to a colorblind man that the 5 you see really is present. Give him a good, solidly logical proof of it, . . .

Sure, you know it's there! You're right, too. But let's see you prove the pattern is there—when it isn't a simple logical pattern!

It is my hunch that psychology is bogged down by the same type of problem, when it comes to the nature of the learning process. True, there is simple, logical correlation learning. Give an animal an electric shock every time it touches X, and the animal establishes the simple, logical correlation X-means-electric-shock. Logical learning of this type exists; certainly.

But . . . pattern-detection learning exists too, and that is not either

logical nor simple. It's a particularly tough nut to crack for a number of self-concealing reasons, too! First off, we are, obviously, primarily interested in human learning patterns; the fact that human beings are the only organisms known that are capable of learning the complex pattern known as language is itself evidence that there's a positive discontinuity—a difference of kind, not merely of degree—between the human learning mechanism and that of other animals. So animal experiments aren't going to help much on this problem.

Moreover, there's plenty of right-here-handly evidence that a human child can learn from other human beings, patterns that the other human beings do not know they know! The child can, in other words, learn something the parent does not, himself, know he knows. The parent, acting on the basis of a subconscious pattern, can educate his child to that subconscious pattern, so that we wind up with the child having learned a pattern that was never consciously known to either parent or child!

This makes things just a little difficult for the psychologist. If the problem is one of psychotherapy, the false education is present and active . . . but no conscious memory of the educational process that installed it is, *or ever was* present!

Now try digging that false-educational pattern into sight!

Equally, the teacher may be trying
(Continued on page 159)



First of Four Parts. Thorby was a slave, a small, sick, unwanted slave, sold to a one-eyed, one-legged beggar, sly old Baslim. And that was the freest time he was ever to know!

Illustrated by van Dangen



CITIZEN OF THE GALAXY

BY ROBERT A. HEINLEIN

"Lot ninety-seven," the auctioneer announced. "A boy."

The boy was dizzy and half sick from the feel of ground underfoot. The slave ship had come more than forty light-years; it carried in its holds the stink of all slave ships, a reek of crowded unwashed bodies, of fear and vomit and ancient grief. Yet in it the boy had been someone, a recognized member of a group, entitled to his meal each day, entitled to fight for his right to eat it in peace. He had even had friends.

Now he was again nothing and nobody, again about to be sold.

A lot had been knocked down on the auction block, matched blonde girls, alleged to be twins; the bidding had been brisk, the price high. The auctioneer turned with a smile of satisfaction and pointed at the boy. "Lot ninety-seven. Shove him up here."

The boy was cuffed and prodded onto the block, stood tense while his feral eyes darted around, taking in what he had not been able to see from the pen. The slave market lies on the spaceport side of the famous Plaza of Liberty, facing the hill crowned by the still more famous Praesidium of the Sargon, capitol of the Nine Worlds. The boy did not recognize it; he did not even know what planet he was on. He looked at the crowd.

Closest to the slave block were beggars, ready to wheedle each buyer as he claimed his property. Beyond

them, in a semicircle, were seats for the rich and privileged. On each flank of this elite group waited their slaves, bearers, and bodyguards and drivers, idling near the ground-cars of the rich and the palanquins and sedan chairs of the still richer. Behind the lords and ladies were commoners, idlers and curious, freedmen and pickpockets and vendors of cold drinks, an occasional commoner merchant not privileged to sit but alert for a bargain in a porter, a clerk, a mechanic, or even a house servant for his wives.

"Lot ninety-seven," the auctioneer repeated. "A fine, healthy lad, suitable as page or tireboy. Imagine him, my lords and ladies, in the livery of your house. Look at—" His words were lost in the scream of a ship, dopplering in at the spaceport behind him.

The old beggar Baslim the Cripple twisted his half-naked body and squinted his one eye over the edge of the block. The boy did not look like a docile house servant to Baslim; he looked a hunted animal, dirty, skinny, and bruised. Under the dirt, the boy's back showed white scar streaks, endorsements of former owners' opinions.

The boy's eyes and the shape of his ears caused Baslim to guess that he might be of unmutated Earth ancestry, but not much could be certain save that he was small, scared, male, and still defiant. The boy caught the beggar staring at him and glared back.

The din died out and a wealthy

dandy seated in front waved a kerchief lazily at the auctioneer. "Don't waste our time, you rascal. Show us something like that last lot."

"Please, noble sir, I must dispose of the lots in catalogue order."

"Then get on with it! Or cuff that starved varmit aside and show us merchandise."

"You are kind, my lord." The auctioneer raised his voice. "I have been asked to be quick and I am sure my noble employer would agree. Let me be frank. This beautiful lad is young; his new owner must invest instruction in him. Therefore—" The boy hardly listened. He knew only a smattering of this language and what was said did not matter anyhow.

He looked over the veiled ladies and elegant men, wondering which one would be his new problem.

". . . a low starting price and a quick turnover. A bargain! Do I hear twenty stellars?"

The silence grew awkward. A lady, sleek and expensive from sandaled feet to lace-veiled face, leaned toward the dandy, whispered and giggled. He frowned, took out a dagger and pretended to groom his nails. "I said to get on with it," he growled.

The auctioneer sighed. "I beg you to remember, gentlefolk, that I must answer to my patron. But we'll start still lower. Ten stellars . . . yes, I said, 'Ten.' Fantastic!"

He looked amazed. "Am I growing deaf? Did someone lift a finger

and I fail to see it? Consider, I beg you. Here you have a fresh young lad like a clean sheet of paper; you can draw any design you like. At this unbelievably low price you can afford to make a mute of him, or alter him as your fancy pleases."

"Or feed him to the fish!"

"'Or feed him—' Oh, you are witty, noble sir!"

"I'm bored. What makes you think that sorry item is worth anything? Your son, perhaps?"

The auctioneer forced a smile. "I would be proud if he were. I wish I were permitted to tell you this lad's ancestry—"

"Which means you don't know."

"Though my lips must be sealed, I can point out the shape of his skull, the perfectly rounded curve of his ears." The auctioneer nipped the boy's ear, pulled it.

The boy twisted and bit his hand. The crowd laughed.

The man snatched his hand away. "A spirited lad. Nothing a taste of leather won't cure. Good stock, look at his ears. The best in the galaxy, some say."

The auctioneer had overlooked something; the young dandy was from Syndon IV. He removed his helmet, uncovering typical Syndonian ears, long, hairy, and pointed. He leaned forward and his ears twitched. "*Who is your noble protector?*"

The old beggar Baslim scooted near the corner of the block, ready to duck. The boy tensed and looked

around, aware of trouble without understanding why. The auctioneer went white—no one sneered at Syndonians face to face . . . not more than once. "My lord," he gasped, "you misunderstood me."

"Repeat that crack about 'ears' and 'the best stock.'"

Police were in sight but not close. The auctioneer wet his lips. "Be gracious, gentle lord. My children would starve. I quoted a common saying—not *my* opinion. I was trying to hasten a bid for this chattel . . . as you yourself urged."

The silence was broken by a female voice saying, "Oh, let him go, Dwarol. It's not his fault how the slave's ears are shaped; he has to sell him."

The Syndonian breathed heavily. "Sell him, then!"

The auctioneer took a breath. "Yes, my lord." He pulled himself together and went on, "I beg my lords' and ladies' pardons for wasting time on a minor lot. I now ask for any bid at all."

He waited, said nervously, "I hear no bid, I see no bid. No bid once . . . if you do not bid, I am required to return this lot to stock and consult my patron before continuing. No bid twice. There are many beautiful items to be offered; it would be a shame not to show them. No bid three—"

"There's your bid," the Syndonian said.

"Eh?" The old beggar was holding up two fingers. The auctioneer stared. "Are *you* offering a bid?"

"Yes," croaked the old man, "if the lords and ladies permit."

The auctioneer glanced at the seated circle. Someone in the crowd shouted, "Why not? Money is money."

The Syndonian nodded; the auctioneer said quickly, "You offer two stellars for this boy?"

"No, no, no, no, no!" Baslim screamed. "Two *minims*!"

The auctioneer kicked at him; the beggar jerked his head aside. The auctioneer shouted, "Get out! I'll teach you to make fun of your betters!"

"Auctioneer!"

"Sir? Yes, my lord?"

The Syndonian said, "Your words were 'any bid at all.' Sell him the boy."

"But—"

"You heard me."

"My lord, I *cannot* sell on one bid. The law is clear; one bid is not an auction. Nor even two unless the auctioneer has set a minimum. With no minimum, I am not allowed to sell with less than three bids. Noble sir, this law was given to protect the owner, not my unhappy self."

Someone shouted, "That's the law!"

The Syndonian frowned. "Then declare the bid."

"Whatever pleases my lords and ladies." He faced the crowd. "For lot ninety-seven: I hear a bid of two minims. Who'll make it four?"

"Four," stated the Syndonian.

"Five!" a voice called out.

The Syndonian motioned the

beggar to him. Baslim moved on hands and one knee, with the stump of the other leg dragging and was hampered by his alms bowl. The auctioneer started droning, "Going at five minims once . . . five minims twice—"

"Six!" snapped the Syndonian, glanced into the beggar's bowl, reached in his purse and threw him a handful of change.

"I hear six. Do I hear seven?"

"Seven," croaked Baslim.

"I'm bid seven. You, over there, with your thumb up. You make it eight?"

"Nine!" interposed the beggar.

The auctioneer glared but put the bid. The price was approaching one stellar, too expensive a joke for most of the crowd. The lords and ladies neither wanted the worthless slave nor wished to queer the Syndonian's jest.

The auctioneer chanted, "Going once at nine . . . going twice at nine . . . going three times—*sold* at nine minims!" He shoved the boy off the block almost into the beggar's lap. "Take him and get out!"

"Softly," cautioned the Syndonian. "The bill of sale."

Restraining himself, the auctioneer filled in price and new owner on a form already prepared for lot ninety-seven. Baslim paid over nine minims—then had to be subsidized again by the Syndonian, as the stamp tax was more than the selling price. The boy stood quietly by. He knew that he had been sold again and he was

getting it through his head that the old man was his new master—not that it mattered; he wanted neither of them. While all were busy with the tax, he made a break.

Without appearing to look the old beggar made a long arm, snagged an ankle, pulled him back. Then Baslim heaved himself erect, placed an arm across the boy's shoulders and used him for a crutch. The boy felt a bony hand clutch his elbow in a strong grip and relaxed himself to the inevitable—another time; they always got careless if you waited.

Supported, the beggar bowed with great dignity. "My lord," he said huskily, "I and my servant thank you."

"Nothing, nothing." The Syndonian flourished his kerchief in dismissal.

From the Plaza of Liberty to the hole where Baslim lived was less than a li, no more than a half mile, but it took them longer than such distance implies. The hopping progress the old man could manage using the boy as one leg was even slower than his speed on two hands and one knee, and it was interrupted frequently by rests for business—not that business ceased while they shuffled along, as the old man required the boy to thrust the bowl under the nose of every pedestrian.

Baslim accomplished this without words. He had tried Interlingua, Space Dutch, Sargonese, half a dozen forms of patois, thieves' kitchen, cant, slave lingo, and trade talk—

even System English—without result, although he suspected that the boy had understood him more than once. Then he dropped the attempt and made his wishes known by sign language and a cuff or two. If the boy and he had no words in common, he would teach him—all in good time, all in good time. Baslim was in no hurry. Baslim was never in a hurry; he took the long view.

Baslim's home lay under the old amphitheater. When Sargon Augustus of imperial memory decreed a larger circus only part of the old one was demolished; the work was interrupted by the Second Cetan War and never resumed. Baslim led the boy into these ruins. The going was rough and it was necessary for the old man to resume crawling. But he never let go his grip. Once he had the boy only by breechclout; the boy almost wriggled out of his one bit of clothing before the beggar snatched a wrist. After that they went more slowly.

They went down a hole at the dark end of a ruined passage, the boy being forced to go first. They crawled over shards and rubble and came into a night-black but smooth corridor. Down again . . . and they were in the performers' barracks of the old amphitheater, under the old arena.

They came in the dark to a well-carpantered door. Baslim shoved the boy through, followed him and closed it, pressed his thumb to a personal lock, touched a switch; light came on. "Well, lad, we're home."

The boy stared. Long ago he had given up having expectations of any sort. But what he saw was not anything he could have expected. It was a modest decent small living room, tight, neat, and clean. Ceiling panels gave pleasant glareless light. Furniture was sparse but adequate. The boy looked around in awe; poor as it was, it was better than anything he remembered ever having lived in.

The beggar let go his shoulder, hopped to a stack of shelves, put down his bowl, and took up a complicated something. It was not until the beggar shucked his clout and strapped the thing in place that the boy figured out what it was: an artificial leg, so well articulated that it rivaled the efficiency of flesh and blood. The man stood up, took trousers from a chest, drew them on, and hardly seemed crippled. "Come here," he said, in Interlingua.

The boy did not move. Baslim repeated it in other languages, shrugged, took the boy by an arm, led him into a room beyond. It was small, both kitchen and washroom; Baslim filled a pan, handed the boy a bit of soap and said, "Take a bath." He pantomimed what he wanted.

The boy stood in mute stubbornness. The man sighed, picked up a brush suitable for floors and started as if to scrub the boy. He stopped with stiff bristles touching skin and repeated, "Take a bath. Wash yourself," saying it in Interlingua and System English.

The boy hesitated, took off his

clout and started slowly to lather himself.

Baslim said, "That's better," picked up the filthy breechclout, dropped it in a waste can, laid out a towel, and, turning to the kitchen side, started preparing a meal.

A few minutes later he turned and the boy was gone.

Unhurriedly he walked into the living room, found the boy naked and wet and trying very hard to open the door. The boy saw him but redoubled his futile efforts. Baslim tapped him on the shoulder, hooked a thumb toward the smaller room. "Finish your bath."

He turned away. The boy slunk after him.

When the boy was washed and dry, Baslim put the stew he had been freshening back on the burner, turned the switch to "simmer" and opened a cupboard, from which he removed a bottle and daubs of vegetable flock. Clean, the boy was a pattern of scars and bruises, unhealed sores and cuts and abrasions, old and new. "Hold still."

The stuff stung; the boy started to wiggle. "Hold still!" Baslim repeated in a pleasant firm tone and slapped him. The boy relaxed, tensing only as the medicine touched him. The man looked carefully at an old ulcer on the boy's knee, then, humming softly, went again to the cupboard, came back and injected the boy in one buttock—first acting out the idea that he would slap his head off his shoulders if he failed

to take it quietly. That done, he found an old cloth, motioned the boy to wrap himself a clout, turned back to his cooking.

Presently Baslim placed big bowls of stew on the table in the living room, first moving chair and table so that the boy might sit on the chest while eating. He added a handful of fresh green lentils and a couple of generous chunks of country bread, black and hard. "Soup's on, lad. Come and get it."

The boy sat down on the edge of the chest but remained poised for flight and did not eat.

Baslim stopped eating. "What's the matter?" He saw the boy's eyes flick toward the door, then drop. "Oh, so that's it." He got up, steadying himself to get his false leg under him, went to the door, pressed his thumb in the lock. He faced the boy. "The door is unlocked," he announced. "Either eat your dinner, or leave." He repeated it several ways and was pleased when he thought that he detected understanding on using the language he surmised might be the slave's native tongue.

But he let the matter rest, went back to the table, got carefully into his chair and picked up his spoon.

The boy reached for his own, then suddenly was off the chest and out the door. Baslim went on eating. The door remained ajar, light streaming out into the labyrinth.

Later, when Baslim had finished a leisurely dinner, he became aware that the boy was watching him from

the shadows. He avoided looking, lounged back, and started picking his teeth. Without turning, he said in the language he had decided might be the boy's own, "Will you come eat your dinner? Or shall I throw it away?"

The boy did not answer. "All right," Baslim went on, "if you won't, I'll have to close the door. I can't risk leaving it open with the light on." He slowly got up, went to the door, and started to close it. "Last call," he announced. "Closing up for the night."

As the door was almost closed the boy squealed, "Wait!" in the language Baslim expected, and scurried inside.

"Welcome," Baslim said quietly. "I'll leave it unlocked, in case you change your mind." He sighed. "If I had my way, no one would ever be locked in."

The boy did not answer but sat down, huddled himself over the food and began wolfing it as if afraid it might be snatched away. His eyes flicked from right to left. Baslim sat down and watched.

The extreme pace slowed but chewing and gulping never ceased until the last bit of stew had been chased with the last hunk of bread, the last lentil crunched and swallowed. The final bites appeared to go down by sheer will power, but swallow them he did, sat up, looked Baslim in the eye and smiled shyly. Baslim smiled back.

The boy's smile vanished. He

turned white, then a light green. A rope of drool came willy-nilly from a corner of his mouth—and he was disastrously sick.

Baslim moved to avoid the explosion. "Stars in heaven, I'm an idiot!" he exclaimed, in his native language. He went into the kitchen, returned with rags and pail, wiped the boy's face and told him sharply to quiet down, then cleaned the stone floor.

After a bit he returned with a much smaller ration, only broth and a small piece of bread. "Soak the bread and eat it."

"I better not."

"Eat it. You won't be sick again. I should have known better, seeing your belly against your backbone, than to give you a man-sized meal. But eat slowly."

The boy looked up and his chin quivered. Then he took a small spoonful. Baslim watched while he finished the broth and most of the bread.

"Good," Baslim said at last. "Well, I'm for bed, lad. By the way, what's your name?"

The boy hesitated. "Thorby."

"'Thorby'—a good name. You can call me 'Pop.' Good night." He unstrapped his leg, hopped to the shelf and put it away, hopped to his bed. It was a peasant bed, a hard mattress in a corner. He scrunched close to the wall to leave room for the boy and said, "Put out the light before you come to bed." Then he closed his eyes and waited.

There was long silence. He heard the boy go to the door; the light

went out. Baslim waited, listening for noise of the door opening. It did not come; instead he felt the mattress give as the boy crawled in. "Good night," he repeated.

"G' night."

He had almost dozed when he realized that the boy was trembling violently. He reached behind him, felt skinny ribs, patted them; the boy broke into sobs.

He turned over, eased his stump into a comfortable position, put an arm around the boy's shaking shoulders and pulled his face against his own chest. "It's all right, Thorby," he said gently, "it's all right. It's

over now. It'll never happen again."

The boy cried out loud and clung to him. Baslim held him, speaking softly until the spasms stopped. Then he held still until he was sure that Thorby was asleep.

II

Thorby's wounds healed, those outside quickly, those inside more slowly. The old beggar acquired another mattress and stuck it in the other corner. But Baslim would sometimes wake to find a small warm bundle snuggled against his spine and know thereby that the boy had



had another nightmare. Baslim was a light sleeper and hated sharing a bed. But he never forced Thorby to go back to his own bed when this happened.

Sometimes the boy would cry out his distress without waking. Once Baslim was jerked awake by hearing Thorby wail, "Mama, Mama!" Without making a light he crawled quickly to the boy's pallet and bent over him. "There, there, son, it's all right."

"Papa?"

"Go back to sleep, son. You'll wake Mama." He added, "I'll stay with you—you're safe. Now be quiet. We don't want to wake Mama . . . do we?"

"All right, Papa."

The old man waited, almost without breathing, until he was stiff and cold and his stump ached. When he was satisfied that the boy was asleep he crawled to his own bed.

That incident caused the old man to try hypnosis. A long time earlier, when Baslim had had two eyes, two legs, and no reason to beg, he had learned the art. But he had never liked hypnosis, even for therapy; he had an almost religious concept of the dignity of the individual; hypnotizing another person did not fit his basic evaluations.

But this was an emergency.

He was sure that Thorby had been taken from his parents so young that he had no conscious memory of them. The boy's notion of his life was a jumbled recollection of masters, some bad, some worse, all of

whom had tried to break the spirit of a "bad" boy. Thorby had explicit memories of some of these masters and described them in gutter speech vivid and violent. But he was never sure of time or place—"place" was some estate, or household, or factor's compound, never a particular planet or sun (his notions of astronomy were mostly wrong and he was innocent of galactography) and "time" was simply "before" or "after," "short" or "long." While each planet has its day, its year, its own method of dating, while they are reconciled for science in terms of the standard second as defined by radioactive decay, the standard year of the birthplace of mankind, and a standard reference date, the first jump from that planet, Sol III, to its satellite, it was impossible for an illiterate boy to date anything that way. Earth was a myth to Thorby and a "day" was the time between two sleeps.

Baslim could not guess the lad's age. The boy looked like unmutated Earth stock and was pre-adolescent, but any guess would be based on unproved assumption. Vandorians and Italo-Glyphs look like the original stock, but Vandorians take three times as long to mature—Baslim recalled the odd tale about the consular agent's daughter whose second husband was the great grandson of her first and she had outlived them both. Mutations do not necessarily show up in appearance.

It was conceivable that this boy was "older" in standard seconds than

Baslim himself; space is deep and mankind adapted itself in many ways to many conditions. Never mind!—he was a youngster and he needed help.

Thorby was not afraid of hypnosis; the word meant nothing to him, nor did Baslim explain. After supper one evening the old man simply said, "Thorby, I want you to do something."

"Sure, Pop. What?"

"Lie down on your bed. Then I'm going to make you sleepy and we'll talk."

"Huh? You mean the other way around, don't you?"

"No. This is a different sort of sleep. You'll be able to talk."

Thorby was dubious but willing. The old man lighted a candle, switched off the glow plates. Using the flame to focus attention he started the ancient routines of monotonous suggestion, of relaxation, drowsiness . . . sleep.

"Thorby, you are asleep but you can hear me. You can answer."

"Yes, Pop."

"You will stay asleep until I tell you to wake. But you will be able to answer any question I ask."

"Yes, Pop."

"You remember the ship that brought you here. What was its name?"

"The *Merry Widow*. Only that wasn't what we called it."

"You remember getting into that ship. Now you are in it—you can see it. You remember all about it.

Now go back to where you were when you went aboard."

The boy stiffened without waking. "I don't want to!"

"I'll be right with you. You'll be safe. Now what is the name of the place? Go back to it. Look at it."

An hour and a half later Baslim still squatted beside the sleeping boy. Sweat poured down wrinkles in his face and he felt badly shaken. To get the boy back to the time he wanted to explore it had been necessary to force him back through experiences disgusting even to Baslim, old and hardened as he was. Repeatedly Thorby had fought against it, nor could Baslim blame him—he felt now that he could count the scars on the boy's back and assign a villain to each.

But he had achieved his purpose: to delve farther back than the boy's waking memory ran, back into his very early childhood, and at last to the traumatic moment when the baby manchild had been taken from his parents.

He left the boy in deep coma while he collected his shattered thoughts. The last few moments of the quest had been so bad that the old man doubted his judgment in trying to dig out the source of the trouble.

Well, let's see . . . what had he found out?

The boy was born free. But he had always been sure of that.

The boy's native language was System English, spoken with an

accent Baslim could not place; it had been blurred by baby speech. That placed him inside the Terran Hegemony; it was even possible—though not likely—that the boy had been born on Earth. That was a surprise; he had thought the boy's native language was Interlingua, since he spoke it better than he did the other three he knew.

What else? Well, the boy's parents were certainly dead, if the confused and terror-ridden memory he had pried out of the boy's skull could be trusted. He had been unable to dig out their family name nor any way of identifying them—they were just "Papa" and "Mama"—so Baslim gave up a half-formed plan of trying to get word to relatives of the boy.

Well, now to make this ordeal he had put the lad through worth the cost—

"Thorby?"

The boy moaned and stirred. "Yes, Pop?"

"You are asleep. You won't wake up until I tell you to."

"I won't wake up until you tell me to."

"When I tell you, you will wake at once. You will feel fine and you won't remember anything we've talked about."

"Yes, Pop."

"You will forget. But you will feel fine. About half an hour later you will feel sleepy again. I'll tell you to go to bed and you will go to bed and go right to sleep. You'll sleep all night, good sleep and pleas-

ant dreams. You won't have any more bad dreams. Say it."

"I won't have any more bad dreams."

"You won't ever have any more bad dreams. Not ever."

"Not ever."

"Papa and Mama don't want you to have any bad dreams. They're happy and they want you to be happy. When you dream about them, it will always be happy dreams."

"Happy dreams."

"Everything is all right now, Thorby. You are starting to wake. You're waking up and you can't remember what we've been talking about. But you'll never have bad dreams again. Wake up, Thorby."

The boy sat up, rubbed his eyes, yawned, and grinned. "Gee, I fell asleep. Guess I played out on you, Pop. Didn't work, huh?"

"Everything's all right, Thorby."

It took more than one session to lay those ghosts, but the nightmares dwindled and stopped. Baslim was not technician enough to remove the bad memories; they were still there. All he did was to implant suggestions to keep them from making Thorby unhappy. Nor would Baslim have removed memories had he been skilled enough; he had a stiff-necked belief that a man's experiences belonged to him and that even the worst should not be taken from him without his consent.

Thorby's days were as busy as his nights had become peaceful. During their early partnership Baslim kept

the boy always with him. After breakfast they would hobble to the Plaza of Liberty, Baslim would sprawl on the pavement and Thorby would stand or squat beside him, looking starved and holding the bowl. The spot was always picked to obstruct foot traffic, but not enough to cause police to do more than growl. Thorby learned that none of the regular police in the Plaza would ever do more than growl; Baslim's arrangements with them were beneficial to underpaid police.

Thorby learned the ancient trade quickly—learned that men with women were generous but that the appeal should be made to the woman, that it was usually a waste of time to ask alms of unaccompanied women—except unveiled women,—that it was an even bet between a kick and a gift in bracing a man alone, that spacemen hitting dirt gave handsomely, especially when unsteady. Baslim taught him to keep a little money in the bowl, neither smallest change nor high denominations.

At first Thorby was just right for the trade; small, half starved, covered with sores, his appearance alone was enough. Unfortunately he soon looked better. Baslim repaired that with make-up, putting shadows under his eyes and hollows in his cheeks. A horrible plastic device stuck on his shinbone provided a realistic large "ulcer" in place of the sores he no longer had; sugar water made it attractive to flies—

people looked away even as they dropped coins in the bowl.

His better-fed condition was not as easy to disguise but he shot up fast for a year or two and continued skinny, despite two hearty meals a day and a bed to toss on.

Thorby soaked up a gutter education beyond price. Jubbulpore, capital of Jubbul and of the Nine Worlds, residence in chief of the Great Sargon, boasts more than three thousand licensed beggars, twice that number of street vendors, more grog shops than temples and more temples than any other city in the Nine Worlds, plus numbers uncountable of sneak thieves, tattoo artists, griva pushers, doxies, cat burglars, back-alley money changers, pickpockets, fortune tellers, muggers, assassins, and grifters large and small. Its inhabitants brag that within a li of the pylon at the spaceport end of the Avenue of Nine anything in the explored universe can be had by a man with cash, from a starship to ten grains of stardust, from the ruin of a reputation to the robes of a senator with the senator inside.

Technically Thorby was not part of the underworld, since he had a legally recognized status (slave) and a licensed profession (beggar). Nevertheless he was in it, with a worm's-eye view. There were no rungs below his on the social ladder.

As a slave he had learned to lie and steal as naturally as other children learn company manners, and much more quickly. But he discovered that these common talents were

raised to high art in the seamy underside of the city. As he grew older, learned the language and the streets, Baslim began to send him out on his own, to run errands, to shop for food, and sometimes to make a pitch by himself while the old man stayed in. Thus he "fell into evil company" if one can fall from elevation zero.

He returned one day with nothing in his bowl. Baslim made no comment but the boy explained. "Look, Pop, I did all right!" From under his clout he drew a fancy scarf and proudly displayed it.

Baslim did not smile and did not touch it. "Where did you get that?"

"I inherited it!"

"Obviously. But from whom?"

"A lady. A nice lady, pretty."

"Let me see the house mark. Hm-m-m . . . probably Lady Fascia. Yes, she is pretty, I suppose. But why aren't you in jail?"

"Why, gee, Pop, it was easy! Ziggie has been teaching me. He knows all the tricks. He's smooth—you should see him work."

Baslim wondered how one taught morals to a stray kitten? He did not consider discussing it in abstract ethical terms; there was nothing in the boy's background, nothing in his present environment, to make it possible to communicate on such a level.

"Thorby, why do you want to change trades? In our business you pay the police their commission, pay your dues to the guild, make an offering at the temple on holy day,

and you've no worries. Have we ever gone hungry?"

"No, Pop—but look at it! It must have cost almost a stellar!"

"At least two stellars, I'd say. But a fence would give you two minims—if he was feeling generous. You should have brought more than that back in your bowl."

"Well . . . I'll get better at it. And it's more fun than begging. You ought to see how Ziggie goes about it."

"I've seen Ziggie work. He's skillful."

"He's the best!"

"Still, I suppose he could do better with two hands."

"Well, maybe, though you only use one hand. But he's teaching me to use either hand."

"That's good. You might need to know—some day you might find yourself short one, the way Ziggie is. You know how Ziggie lost his hand?"

"Huh?"

"You know the penalty? If they catch you?"

Thorby did not answer. Baslim went on, "One hand for the first offense—that's what it cost Ziggie to learn his trade. Oh, he's good, for he's still around and plying his trade. You know what the second offense carries? Not just the other hand. You know?"

Thorby gulped. "I'm not sure."

"I think you must have heard; you don't want to remember." Baslim drew his thumb across his throat. "That's what Ziggie gets next time

—they shorten him. His Serenity's justices figure that a boy who can't learn once won't learn twice, so they shorten him."

"But, Pop, I won't be caught! I'll be awful careful . . . just like today. I promise!"

Baslim sighed. The kid still believed that it couldn't happen to him. "Thorby, get your bill of sale."

"What for, Pop?"

"Get it."

The boy fetched it; Baslim examined it—"one male child, registered number (left thigh) 8XK40367"—nine minims and get out of here, you! He looked at Thorby and noted with surprise that he was a head taller than he had been that day. "Get my stylus. I'm going to free you. I've always meant to, but there didn't seem to be any hurry. But we'll do it now and tomorrow you go to the Royal Archives and register it."

Thorby's jaw dropped. "What for, Pop?"

"Don't you want to be free?"

"Uh . . . well . . . gee, Pop, I *like* belonging to *you*."

"Thanks, lad. But I've got to do it."

"You mean you're kicking me out?"

"No. You can stay. But only as a freedman. You see, son, a master is responsible for his bondservant. If I were a noble and you did something, I'd be fined. But since I'm not . . . well, if I were shy a hand, as well as a leg and an eye, I don't

think I could manage. So if you're going to learn Ziggie's trade, I had better free you; I can't afford the risk. You'll have to take your own chances; I've lost too much already. Any more and I'd be better off shortened."

He put it brutally, never mentioning that the law in application was rarely so severe—in practice, the slave was confiscated, sold, and his price used in restitution, if the master had no assets. If the master were a commoner, he might also get a flogging if the judge believed him to be actually as well as legally responsible for the slave's misdeed. Nevertheless Baslim had stated the law: since a master exercised high and low justice over a slave, he was, therefore, liable in his own person for his slave's acts, even to capital punishment.

Thorby started to sob, for the first time since the beginning of their relationship. "Don't turn me loose, Pop—please don't! I've *got* to belong to you!"

"I'm sorry, son. I told you you don't have to go away."

"Please, Pop. I won't ever swipe another thing!"

Baslim took his shoulder. "Look at me, Thorby. I'll make you a bargain."

"Huh? Anything you say, Pop. As long as—"

"Wait till you hear it. I won't sign your papers now. But I want you to promise two things."

"Huh? Sure! What?"

"Don't rush. The first is that you

promise never again to steal anything, from anybody. Neither from fine ladies in sedan chairs, nor from poor people like ourselves—one is too dangerous and the other . . . well, it's disgraceful, though I don't expect you to know what that means. The second is to promise that you will never lie to me about anything . . . *not anything*."

Thorby said slowly, "I promise."

"I don't mean just lying about the money you've been holding out on me, either. I mean *anything*. By the way, a mattress is no place to hide money. Look at me, Thorby. You know I have connections throughout the city."

Thorby nodded. He had delivered messages for the old man to odd places and unlikely people. Baslim went on, "If you steal, I'll find out . . . eventually. If you lie to me, I'll catch you . . . eventually. Lying to other people is your business, but I tell you this: once a man gets a reputation as a liar, he might as well be struck dumb, for people do not listen to the wind. Never mind. The day I learn that you have stolen anything . . . or the day I catch you lying to me . . . I sign your papers and free you."

"Yes, Pop."

"That's not all. I'll kick you out with what you had when I bought you—a breechclout and a set of bruises. You and I will be finished. If I set eyes on you again, I'll spit on your shadow."

"Yes, Pop. Oh, I never will, Pop!"

"I hope not. Go to bed."

Baslim lay awake, worrying, wondering if he had been too harsh. But, confound it, it was a harsh world; he had to teach the kid to live in it.

He heard a sound like a rodent gnawing; he held still and listened. Presently he heard the boy get up quietly and go to the table; there followed a muted jingle of coins being placed on wood and he heard the boy return to his pallet.

When the boy started to snore he was able to drop off to sleep himself.

III

Baslim had long since taught Thorby to read and write Sargonese and Interlingua, encouraging him with cuffs and other inducements since Thorby's interest in matters intellectual approached zero. But the incident involving Ziggy and the realization that Thorby was growing up reminded Baslim that time did not stand still, not with kids.

Thorby was never able to place the time when he realized that Pop was not exactly—or not entirely—a beggar. The extremely rigorous instruction he now received, expedited by such unlikely aids as a recorder, a projector, and a sleep instructor, would have told him, but by then nothing Pop could do or say surprised him—Pop knew everything and could manage anything. Thorby had acquired enough knowledge of other beggars to see

discrepancies; he was not troubled by them—Pop was Pop, like the sun and the rain.

They never mentioned outside their home anything that happened inside, nor even where it was; no guest was ever there. Thorby acquired friends and Baslim had dozens or even hundreds and seemed to know the whole city by sight. But no one but Thorby had access to Baslim's hideaway. But Thorby was aware that Pop had activities unconnected with begging. One night they went to sleep as usual; Thorby awakened about dawn to hear someone stirring and called out sleepily, "Pop?"

"Yes. Go back to sleep."

Instead the boy got up and switched on the glow plates. He knew it was hard for Baslim to get around in the dark without his leg; if Pop wanted a drink of water or anything, he'd fetch it. "You all right, Pop?" he asked, turning away from the switch.

Then he gasped in utter shock. This was a stranger, a *gentleman*!

"It's all right, Thorby," the stranger said with Pop's voice. "Take it easy, son."

"Pop?"

"Yes, son. I'm sorry I startled you—I should have changed before I came back. Events pushed me." He started stripping off fine clothing.

When Baslim removed the evening head dress, he looked more like Pop . . . except for one thing. "Pop . . . your eye."

"Oh, that. It comes out as easily

as it went in. I look better with two eyes, don't I?"

"I don't know." Thorby stared at it worriedly. "I don't think I like it."

"So? Well, you won't often see me wear it. As long as you are awake you can help."

Thorby was not much help; everything Pop did was new to him. First Baslim dug tanks and trays from a food cupboard which appeared to have an extra door in its back. Then he removed the false eye and, handling it with great care, unscrewed it into two parts and removed a tiny cylinder, using tweezers.

Thorby watched the processing that followed but did not understand, except that he could see that Pop was working with extreme care and exact timing. At last Baslim said, "All done. Now we'll see if I got any pictures."

Baslim inserted the spool in a microviewer, scanned it, smiled grimly and said, "Get ready to go out. Skip breakfast. You can take along a piece of bread."

"Huh?"

"Get moving. No time to waste."

Thorby put on his make-up and clout and dirtied his face. Baslim was waiting with a photograph and a small flat cylinder about the size of a half-minim bit. He shoved the photo at Thorby. "Look at it. Memorize it."

"Why?"

Baslim pulled it back. "Would you recognize that man?"

"Uh . . . let me see it again."



"You've *got* to know him. Look at it well this time."

Thorby did so, then said, "All right, I'll know him."

"He'll be in one of the taprooms near the port. Try Mother Shaum's first, then the Supernova and the Veiled Virgin. If you don't hit, work both sides of Joy Street until you do. You've *got* to find him before the third hour."

"I'll find him, Pop."

"When you do, put this thing in your bowl along with a few coins. Then tell him the tale but be sure to mention that you are the son of Baslim the Cripple."

"Got it, Pop."

"Get going."

Thorby wasted no time getting down to the port. It was the morning following the Feast of the Ninth

Moon and few were stirring; he did not bother to pretend to beg en route, he simply went the most direct way, through back courts, over fences, or down streets, avoiding only the sleepy night patrol. But, though he reached the neighborhood quickly, he had the Old One's luck in finding his man; he was in none of the dives Baslim had suggested, nor did the rest of Joy Street turn him up. It was pushing the deadline and Thorby was getting worried when he saw the man come out of a place he had already tried.

Thorby ducked across the street, came up behind him. The man was with another man—not good. But Thorby started in:

"Alms, gentle lords! Alms for mercy on your souls!"

The wrong man tossed him a coin; Thorby caught it in his teeth.

"Bless you, my lord!" He turned to the other. "Alms, gentle sir. A small gift for the unfortunate. I am the son of Baslim the Cripple and—"

The first man aimed a kick at him. "Get out."

Thorby rolled away from it. ". . . Son of Baslim the Cripple. Poor old Baslim needs soft foods and medicines. I am all alone—"

The man of the picture reached for his purse. "Don't do it," his companion advised. "They're all liars and I've paid him to let us alone."

"'Luck for the jump,'" the man answered. "Now let me see—" He fumbled in his purse, glanced into the bowl, placed something in it.

"Thank you, my lords. May your children be sons." Thorby moved on before he looked. The tiny flat cylinder was gone.

He worked on up Joy Street, doing fairly well, and checked the Plaza before heading home. To his surprise Pop was in his favorite pitch, by the auction block and facing the port. Thorby slipped down beside him. "Done."

The old man grunted.

"Why don't you go home, Pop? You must be tired. I've made us a few bits already."

"Shut up. Alms, my lady! Alms for a poor cripple."

At the third hour a ship took off with a *whoosh!* that dopplered away into subsonics; the old man seemed to relax. "What ship was that?" Thorby asked. "Not the Syndon liner."

"Free Trader *Romany Lass*, bound for the Rim . . . and your friend was in her. You go home now and get your breakfast. No, go buy your breakfast, for a treat."

Baslim no longer tried to hide his extraprofessional activities from Thorby, although he never explained the why or how. Some days only one of them would beg, in which case the Plaza of Liberty was always the pitch, for it appeared that Baslim was especially interested in arrivals and departures of ships and most especially movements of slave ships and the auction that always followed the arrival of one.

Thorby was more use to him after his education had progressed. The old man seemed to think that everyone had a perfect memory and he was stubborn enough to impress his belief despite the boy's grumbles.

"Aw, Pop, how do you expect me to remember? You didn't give me a chance to *look* at it!"

"I projected that page at least three seconds. Why didn't you read it?"

"Huh? There wasn't time."

"I read it. You can, too. Thorby, you've seen jugglers in the Plaza. You've seen old Mikki stand on his head and keep nine daggers in the air while he spins four hoops with his feet?"

"Uh, sure."

"Can you do that?"

"No."

"Could you learn to?"

"Uh . . . I don't know."

"*Anyone* can learn to juggle . . . with enough practice and enough beatings." The old man picked up a spoon, a stylus, and a knife and kept them in the air in a simple fountain. Presently he missed and stopped. "I used to do a little, just for fun. This is juggling with the mind . . . and anyone can learn *it*, too."

"Show me how you did that, Pop."

"Another time, if you behave yourself. Right now you are learning to use your eyes. Thorby, this mind-juggling was developed a long time ago by a wise man, a Dr. Renshaw, on the planet Earth. You've heard of Earth."

"Well . . . sure, I've heard of it. But I've heard of Heaven, too."

"Hm-m-m . . . meaning you think it's a temple allegory for holy days?"

"Uh, I don't know . . . but all that stuff about frozen water falling from the sky, and cannibals ten feet tall, and towers higher than the Praesidium, and little men no bigger than dolls that live in trees—well, I'm not a fool, Pop."

Baslim sighed and wondered how many thousands of times he had sighed since saddling himself with a son. "Stories get mixed up. Some day—when you've learned to read—I'll let you view books you can trust."

"But I can read now."

"You just think you can. Thorby, there is such a place as Earth and it truly is strange and wonderful—a most unlikely planet. Many wise

men have lived and died there—along with the usual proportion of fools and villains—and some of their wisdom has come down to us. Samuel Renshaw was one such wise man. He proved that most people go all their lives only half awake; more than that, he showed how a man could wake up and live—see with his eyes, hear with his ears, taste with his tongue, think with his mind, and remember perfectly what he saw, heard, tasted, thought." The old man shoved his stump out. "This doesn't make me a cripple. I see more with my one eye than you do with two. I am growing deaf—but not as deaf as you are, because what I hear, I remember. Which one of us is the cripple? But, son, you aren't going to stay crippled, for I am going to renshaw you if I have to beat your silly head in!"

As Thorby learned to use his mind, he found that he liked to; he developed an insatiable appetite for the printed page, until, night after night, Baslim would order him to turn off the viewer and go to bed. Thorby didn't see any use in much of what the old man forced him to learn—languages, for example, that Thorby had never heard. But they were not hard, with his new skill in using his mind, and when he discovered that the old man had spools and reels which could be read or listened to only in these "useless" tongues, he suddenly found them worth knowing. History and galactography he loved; his personal

world, light-years wide in physical space, had been in reality as narrow as a slave factor's pen. Thorby reached for wider horizons with the delight of a baby discovering its fist.

But mathematics Thorby saw no use in, other than the barbaric skill of counting money. But presently he learned that mathematics need not have use; it was a game, like chess but more fun.

The old man wondered sometimes what use it all was? That the boy was even brighter than he had thought, he now knew. But was it fair to the boy? Was he simply teaching him to be discontented with his lot? What chance on Jubbul had the slave of a beggar? Zero raised to the *n*th power remained zero.

"Thorby."

"Yeah, Pop. Just a moment, I'm in the middle of a chapter."

"Finish it later. I want to talk with you."

"Yes, my lord. Yes, master. Right away, boss."

"And keep a civil tongue in your head."

"Sorry, Pop. What's on your mind?"

"Son, what are you going to do when I'm dead?"

Thorby looked stricken. "Are you feeling bad, Pop?"

"No. So far as I know, I'll last for years. On the other hand, I may not wake up tomorrow. At my age you never know. If I don't, what

are you going to do? Hold down my pitch in the Plaza?"

Thorby didn't answer; Baslim went on, "You can't and we both know it. You're already so big that you can't tell the tale convincingly. They don't give the way they did when you were little."

Thorby said slowly, "I haven't meant to be a burden, Pop."

"Have I complained?"

"No." Thorby hesitated. "I've thought about it . . . some. Pop, you could hire me out to a labor company."

The old man made an angry gesture. "That's no answer! No, son, I'm going to send you away."

"Pop! You promised you wouldn't."

"I promised nothing."

"But I don't want to be freed, Pop. If you free me—well, if you do, I won't leave!"

"I didn't exactly mean that."

Thorby was silent for a long moment. "You're going to sell me, Pop?"

"Not exactly. Well . . . yes and no."

Thorby's face held no expression. At last he said quietly, "It's one or the other, so I know what you mean . . . and I guess I oughtn't to kick. It's your privilege and you've been the best . . . master . . . I ever had."

"I'm not your master!"

"Paper says you are. Matches the number on my leg."

"Don't talk that way! Don't ever talk that way."

"A slave had better talk that way, or else keep his mouth shut."

"Then, for Heaven's sake, keep it shut! Listen, son, let me explain. There's nothing here for you and we both know it. If I die without freeing you, you revert to the Sargon—"

"They'll have to catch me!"

"They will. But manumission solves nothing. What guilds are open to freedmen? Begging, yes—but you'd have to poke out your eyes to do well at it, after you're grown. Most freedmen work for their former masters, as you know, for the free-born commoners leave mighty slim pickings. They resent an ex-slave; they won't work with him."

"Don't worry, Pop. I'll get by."

"I do worry. Now you listen. I'm going to arrange to sell you to a man I know, who will ship you away from here. Not a slave ship, just a ship. But instead of shipping you where the bill of lading reads, you'll—"

"No!"

"Hold your tongue. You'll be dropped on a planet where slavery is against the law. I can't tell you which one, because I am not sure of the ship's schedule, nor even what ship; the details have to be worked out. But in any free society I have confidence you can get by." Baslim stopped to mull a thought he had had many times. Should he send the kid to Baslim's own native planet? No, not only would it be extremely difficult to arrange but it was not a place to send a green

immigrant . . . get the lad to any frontier world, where a sharp brain and willingness to work were all a man needed; there were several within trading distance of the Nine Worlds. He wished tiredly that there were some way of knowing the boy's own home world. Possibly he had relatives there, people who would help him. Confound it, there ought to be a galaxy-wide method of identification!

Baslim went on, "That's the best I can do. You'll have to behave as a slave between the sale and being shipped out. But what's a few weeks against a chance—"

"No!"

"Don't be foolish, son."

"Maybe I am. But I won't do it. I'm staying."

"So? Son . . . I hate to remind you—but you can't stop me."

"Huh?"

"As you pointed out, there's a paper that says I can."

"Oh."

"Go to bed, son."

Baslim did not sleep. About two hours after they had put out the light he heard Thorby get up very quietly. He could follow every move the lad made by interpreting muffled sounds. Thorby dressed—a simple matter of wrapping his clout—he went into the adjoining room, fumbled in the bread safe, drank deeply, and left. He did not take his bowl; he did not go near the shelf where it was kept.

After he was gone, Baslim turned over and tried to sleep, but the

ache inside him would not permit. It had not occurred to him to speak the word that would keep the boy; he had too much self-respect not to respect another person's decision.

Thorby was gone four days. He returned in the night and Baslim heard him but again said nothing. Instead he went quietly and deeply asleep for the first time since Thorby had left. But he woke at the usual time and said, "Good morning, son."

"Uh, good morning, Pop."

"Get breakfast started. I have something to attend to."

They sat down presently over bowls of hot mush. Baslim ate with his usual careful disinterest; Thorby merely picked at his. Finally he blurted out, "Pop, when are you going to sell me?"

"I'm not."

"Huh?"

"I registered your manumission at the Archives the day you left. You're a free man, Thorby."

Thorby looked startled, then dropped his eyes to his food. He busied himself building little mountains of mush that slumped as soon as he shaped them. Finally he said, "I wish you hadn't."

"If they picked you up, I didn't want you to have 'escaped slave' against you."

"Oh." Thorby looked thoughtful. "That's 'F&B,' isn't it? Thanks, Pop. I guess I acted kind of silly."

"Possibly. But it wasn't the punishment I was thinking of. Flogging

is over quickly, and so is branding. I was thinking of a possible second offense. It's better to be shortened than to be caught again after a branding."

Thorby abandoned his mush entirely. "Pop? Just what does a lobotomy do to you?"

"Hm-m-m . . . you might say it makes the thorium mines endurable. But let's not go into it, not at meal times. Speaking of such, if you are through, get your bowl and let's not dally. There's an auction this morning."

"You mean I can stay?"

"This is your home."

Baslim never again suggested that Thorby leave him. Manumission made no difference in their routine or relationship. Thorby did go to the Royal Archives, paid the fee and the customary gift and had a line tattooed through his serial number, the Sargon's seal tattooed beside it with book and page number of the record which declared him to be a free subject of the Sargon, entitled to taxes, military service, and starvation without let or hindrance. The clerk who did the tattooing looked at Thorby's serial number and said, "Doesn't look like a birthday job, kid. Your old man go bankrupt? Or did your folks sell you just to get rid of you?"

"None of your business!"

"Don't get smart, kid, or you'll find that this needle can hurt even more. Now give me a civil answer. I see it's a factor's mark, not a private owner's, and from the way

it has spread and faded, you were maybe five or six. When and where was it?"

"I don't know. Honest I don't."

"So? That's what I tell my wife when she asks personal questions. Quit wiggling; I'm almost through. There . . . congratulations and welcome to the ranks of free men. I've been free a parcel of years now and I predict that you will find it looser but not always more comfortable."

IV

Thorby's leg hurt for a couple of days; otherwise manumission left his life unchanged. But he really was becoming inefficient as a beggar; a strong healthy youth does not draw the alms that a skinny child can. Often Baslim would have Thorby place him on his pitch, then send him on errands or tell him to go home and study. However, one or the other was always in the Plaza. Baslim sometimes disappeared, with or without warning; when this happened it was Thorby's duty to spend daylight hours on the pitch, noting arrivals and departures, keeping mental notes of slave auctions, and picking up information about both traffics through contacts around the port, in the wineshops, and among the unveiled women.

Once Baslim was gone for a double nineday; he was simply missing when Thorby woke up. It was much longer than he had ever been away before; Thorby kept telling himself

that Pop could look out for himself, while having visions of the old man dead in a gutter. But he kept track of the doings at the Plaza, including three auctions, and recorded everything that he had seen and had been able to pick up.

Then Baslim returned. His only comment was, "Why didn't you memorize it instead of recording?"

"Well, I did. But I was afraid I would forget something, there was so much."

After that Baslim seemed even quieter, more reserved, than he had always been. Thorby wondered if he had displeased him, but it was not the sort of question Baslim answered. Finally one night the old man said, "Son, we never did settle what you are to do after I'm gone."

"Huh? But I thought we had decided that, Pop. It's my problem."

"No, I simply postponed it . . . because of your thick-headed stubbornness. But I can't wait any longer. I've got orders for you and you are going to carry them out."

"Now, wait a minute, Pop! If you think you can bully me into leaving you—"

"Shut up! I said, 'After I'm gone.' When I'm dead, I mean; not one of these little business trips . . . you are to look up a man and give him a message. Can I depend on you? Not goof off and forget it?"

"Why, of course, Pop. But I don't like to hear you talk that way. You're going to live a long time—you might even outlive me."

"Possibly. But will you shut up and listen, then do as I tell you?"

"Yes, sir."

"You'll find this man—it may take a while—and deliver this message. Then he will have something for you to do . . . I think. If he does, I want you to do exactly what he tells you to. Will you do that also?"

"Why, of course, Pop, if that's what you want."

"Count it as one last favor to an old man who tried to do right by you and would have done better had he been able. It's the very last thing I want from you, son. Don't bother to burn an offering for me at the temple, just do these two things: deliver a message and one more thing, whatever the man suggests that you do."

"I will, Pop," Thorby answered solemnly.

"All right. Let's get busy."

The "man" turned out to be any one of five men. Each was skipper of a starship, a tramp trader, not of the Nine Worlds but occasionally picking up cargoes from ports of the Nine Worlds. Thorby thought over the list. "Pop, there's only one of these ships I recall ever putting down here."

"They all have, one time or another."

"It might be a long time before one showed up."

"It might be years. But when it happens, I want the message delivered exactly."

"To any of them? Or all of them?"

"The first one who shows up."

The message was short but not easy, for it was in three languages, depending on who was to receive it, and none of the languages was among those Thorby knew. Nor did Baslim explain the words; he wanted it learned by rote in all three.

After Thorby had stumbled through the first version of the message for the seventh time Baslim covered his ears. "No, no! It won't do, son. That accent!"

"I'm doing my best," Thorby answered sullenly.

"I know. But I want the message understood. See here, do you remember a time when I made you sleepy and talked to you?"

"Huh? I get sleepy every night. I'm sleepy now."

"So much the better." Baslim put him into a light trance—with difficulty as Thorby was not as receptive as he had been as a child. But Baslim managed it, recorded the message in the sleep instructor, set it running and let Thorby listen, with post-hypnotic suggestion that he would be able to say it perfectly when he awakened.

He was able to. The second and third versions were implanted in him the following night. Baslim tested him repeatedly thereafter, using the name of a skipper and a ship to bring each version forth.

Baslim never sent Thorby out of the city; a slave required a travel permit and even a freedman was



required to check in and out. But he did send him all over the metropolis. Three ninedays after Thorby had learned the messages Baslim gave him a note to deliver in the shipyard area, which was a reserve of the Sargon rather than part of the city. "Carry your freedman's tag and leave your bowl behind. If a policeman stops you, tell him you're looking for work in the yards."

"He'll think I'm crazy."

"But he'll let you through. They do use freedmen, as sweepers and

such. Carry the message in your mouth. Who are you looking for?"

"A short, red-haired man," Thorby repeated, "with a big wart on the left side of his nose. He runs a lunch stand across from the main gate. No beard. I'm to buy a meat pie and slip him the message with the money."

"Right."

Thorby enjoyed the outing. He did not wonder why Pop didn't viewphone messages instead of



sending him a half day's journey; people of their class did not use such luxuries. As for the royal mails, Thorby had never sent or received a letter and would have regarded the mails as a most chancy way to send a note.

His route followed one arc of the spaceport through the factory district. He relished that part of the city; there was always so much going on, so much life and noise. He dodged traffic, with truck drivers cursing him and Thorby answering with in-

terest; he peered in each open door, wondering what all the machines were for and why commoners would stand all day in one place, doing the same thing over and over—or were they slaves? No, they couldn't be; slaves weren't allowed to touch power machinery except on plantations—that was what the riots had been about last year and the Sargon had lifted his hand in favor of the commoners.

Was it true that the Sargon never slept and that his eye could see anything in the Nine Worlds? Pop said that was nonsense, the Sargon was just a man, like anybody. But if so, how did he get to be Sargon?

He left the factories and skirted the shipyards. He had never been this far before. Several ships were in for overhaul and two small ships were being built, cradled in lacy patterns of steel. Ships made his heart lift and he wished he were going somewhere. He knew that he had traveled by starship twice—or was it three times?—but that was long ago and he didn't mean traveling in the hold of a slaver, that wasn't traveling!

He got so interested that he almost walked past the lunch stand. The main gate reminded him; it was twice as big as the others, had a guard on it, and a big sign curving over it with the seal of the Sargon on top. The lunch stand was across from it; Thorby dodged traffic pouring through the gate and went to it.

The man behind the counter was

not the right man; what little hair he had was black and his nose had no wart.

Thorby walked up the road, killed a half hour and came back. There was still no sign of his man. The counterman noticed his inspection, so Thorby stepped forward and said, "Do you have sunberry crush?"

The man looked him over. "Money?"

Thorby was used to being required to prove his solvency; he dug out the coin. The man scooped it up, opened a bottle for him. "Don't drink at the counter, I need the stools."

There were plenty of stools, but Thorby was not offended; he knew his social status. He stood back but not so far as to be accused of trying to abscond with the bottle, then made the drink last a long time. Customers came and went; he checked each, on the chance that the red-headed man might have picked this time to eat. He kept his ears cocked.

Presently the counterman looked up. "You trying to wear that bottle out?"

"Just through, thanks." Thorby came up to put the bottle down and said, "Last time I was over this way a red-headed chap was running this place."

The man looked at him. "You a friend of Red?"

"Well, not exactly. I just used to see him here, when I'd stop for a cold drink, or—"

"Let's see your permit."

"What? I don't need—" The man grabbed at Thorby's wrist. But Thorby's profession had made him adept at dodging kicks, cuffs, canes, and such; the man clutched air.

The man came around the counter, fast; Thorby ducked into traffic. He was halfway across the street and had had two narrow escapes before he realized that he was running toward the gate—and that the counterman was shouting for the guard there.

Thorby turned and started dodging traffic endwise. Fortunately it was dense; this road carried the burden of the yards. He racked up three more brushes with death, saw a side street that dead-ended into the throughway, ducked between two trucks, down the side street as fast as he could go, turned into the first alley, ran down it, hid behind an outbuilding and waited.

He heard no pursuit.

He had been chased many times before, it did not panic him. A chase was always two parts: first breaking contact, second the retiring action to divorce oneself from the incident. He had accomplished the first; now he had to get out of the neighborhood without being spotted—slow march and no suspicious moves. In losing himself he had run away from the city, turned left into the side street, turned left again into the alley; he was now almost behind the lunch stand—it had been a subconscious tactic. The chase always moved away from the center; the

lunch stand was one place where they would not expect him to be. Thorby estimated that in five minutes, or ten, the counterman would be back at his job and the guard back at the gate; neither one could leave his post unwatched. Shortly, Thorby could go on through the alley and head home.

He looked around. The neighborhood was commercial land not yet occupied by factories, jumble of small shops, marginal businesses, hovels, and hopeless minor enterprise. He appeared to be in back of a very small hand laundry; there were poles and lines and wooden tubs and steam came out a pipe in the outbuilding. He knew his location now—two doors from the lunch stand; he recalled a homemade sign "MAJESTIC HOME LAUNDRY—Lowest Prices."

He could cut around this building and—but better check first. He dropped flat and stuck an eye around the corner of the outbuilding, sighted back down the alley.

Oh, oh!—two patrolmen moving up the alley . . . he had been wrong, wrong! They hadn't dropped the matter, they had sent out the alarm. He pulled back and looked around. The laundry? No. The outbuilding? The patrol would check it. Nothing but to run for it—right into the arms of another patrol. Thorby knew how fast the police could put a cordon around a district. Near the Plaza he could go through their nets, but here he was in strange terrain.

His eye lit on a worn-out wash tub . . . then he was under it. It was a tight fit, with knees to his chin and splinters in his spine. He was afraid that his clout was sticking out but it was too late to correct it; he heard someone coming.

Footsteps came toward the tub and he stopped breathing. Someone stepped on the tub and stood on it.

"Hi there, mother!" It was a man's voice. "You been out here long?"

"Long enough. Mind that pole, you'll knock the clothes down."

"See anything of a boy?"

"What boy?"

"Youngster, getting man tall. Fuzz on his chin. Breech clout, no sandals."

"Somebody," the woman's voice above him answered indifferently, "came running through here like his ghost was after him. I didn't really see him—I was trying to get this pesky line up."

"That's our baby! Where'd he go?"

"Over that fence and between those houses."

"Thanks, mother! Come on, Juby."

Thorby waited. The woman continued whatever she was doing; her feet moved and the tub creaked. Then she stepped down and sat on the tub. She slapped it gently. "Stay where you are," she said softly. A moment later he heard her go away.

Thorby waited until his bones ached. But he resigned himself to

staying under that tub until dark. It would be chancy, as the night patrol questioned everyone but nobles after curfew, but leaving this neighborhood in daylight had become impossible. Thorby could not guess why he had been honored by a turn-out of the guard, but he did not want to find out. He heard someone—the woman?—moving around the yard from time to time.

At least an hour later he heard the creak of ungreased wheels. Someone tapped on the tub. "When I lift the tub, get into the cart, fast. It's right in front of you."

Thorby did not answer. Daylight hit his eyes, he saw a small pushcart—and was in it and trying to make himself small. Laundry landed on him. But before that blanked out his sight he saw that the tub was no longer nakedly in the open; sheets had been hung on lines so that it was screened.

Hands arranged bundles over him and a voice said, "Hold still until I tell you to move."

"O.K. . . . and thanks a million! I'll pay you back some day."

"Forget it." She breathed heavily. "I had a man once. Now he's in the mines. I don't care what you've done—I don't turn anybody over to the patrol."

"Oh, I'm sorry."

"Shut up."

The little cart bumped and wobbled and presently Thorby felt the change to pavement. Occasionally they stopped; the woman would remove a bundle, be gone a few

minutes, come back and dump dirty clothes into the cart. Thorby took it with the long patience of a beggar.

A long time later the cart left pavement. It stopped and the woman said in a low voice, "When I tell you, get out the righthand side and keep going. Make it fast."

"O.K. And thanks again!"

"Shut up." The cart bumped along a short distance, slowed without stopping, and she said, "Now!"

Thorby threw off his covering, bounced out and landed on his feet, all in one motion. He was facing a passage between two buildings, a serviceway from alley to street. He started down it fast but looked back over his shoulder.

The cart was just disappearing. He never did see her face.

Two hours later he was back in his own neighborhood. He slipped down beside Baslim. "No good."

"Why not?"

"Snoopies. Squads of 'em."

"Alms, gentle sir! You swallowed it? Alms for the sake of your parents!"

"Of course."

"Take the bowl." Baslim got to hands and knee, started away.

"Pop! Don't you want me to help you?"

"You stay here."

Thorby stayed, irked that Pop had not waited for a full report. He hurried home as soon as it was dark, found Baslim in the kitchen-washroom, paraphernalia spread around him and using both recorder and

book projector. Thorby glanced at the displayed page, saw that he could not read it and wondered what language it was—an odd one; the words were all seven letters, no more, no less. "Hi, Pop. Shall I start supper?"

"No room . . . and no time. Eat some bread. What happened today?"

Thorby told him, while munching bread. Baslim simply nodded. "Lie down. I've got to use hypnosis on you again. We've got a long night ahead."

The material Baslim wanted him to memorize consisted of figures, dates, and endless three-syllable nonsense words. The light trance felt dreamily pleasant and the droning of Baslim's voice coming out of the recorder was pleasant, too.

During one of the breaks, when Baslim had commanded him to wake up, he said, "Pop, who's this message for?"

"If you ever get a chance to deliver it, you'll know; you won't have any doubts. If you have trouble remembering it, tell him to put you into a light trance; it'll come back."

"Tell whom?"

"Him. Never mind. You are going to sleep. You are asleep." Baslim snapped his fingers.

While the recorder was droning Thorby was vaguely aware once that Baslim had just come in. He was wearing his false leg, which affected Thorby with dreamy surprise; Pop ordinarily wore it only indoors. Once Thorby smelled smoke and thought dimly that something must be burn-

ing in the kitchen and he should go check. But he was unable to move and the nonsense words kept droning into his ears.

He became aware that he was droning back to Pop the lesson he had learned. "Did I get it right?"

"Yes. Now go to sleep. Sleep the rest of the night."

Baslim was gone in the morning. Thorby was not surprised; Pop's movements had been even less predictable than usual lately. He ate breakfast, took his bowl and set out for the Plaza. Business was poor—Pop was right; Thorby now looked too healthy and well fed for the profession. Maybe he would have to learn to dislocate his joints like Granny the Snake. Or buy contact lenses with cataracts built into them.

Midafternoon an unscheduled freighter grounded at the port. Thorby started the usual inquiries, found that it was the Free Trader *Sisu*, registered home port New Finlandia, Shiva III.

Ordinarily this would have been a minor datum, to be reported to Pop when he saw him. But Captain Krausa of the *Sisu* was one of the five persons to whom Thorby was some day to deliver a message, if and when.

It fretted Thorby. He knew that he was not to look up Captain Krausa—that was the distant future, for Pop was alive and well. But maybe Pop would be anxious to know that this ship had arrived. Tramp freighters came and went, nobody knew when, and sometimes

they were in port only a few hours.

Thorby told himself that he could get home in five minutes—and Pop might thank him. At worst he would bawl him out for leaving the Plaza, but, shucks, he could pick up anything he missed, through gossip.

Thorby left.

The ruins of the old amphitheater extend around one third of the periphery of the new. A dozen holes lead down into the labyrinth which had served the old slave barracks; an unlimited number of routes ran underground from these informal entrances to that part which Baslim had pre-empted as a home. Thorby and he varied their route in random fashion and avoided being seen entering or leaving.

This time, being in a hurry, Thorby went to the nearest—and on past; there was a policeman at it. He continued as if his destination had been a tiny greengrocer's booth on the street rimming the ruins. He stopped and spoke to the proprietress. "Howdy, Inga. Got a nice ripe melon you're going to have to throw away?"

"No melons."

He displayed money. "How about that big one? Half price and I won't notice the rotten spot." He leaned closer. "What's burning?"

Her eyes flicked toward the patrolman. "Get lost."

"Raid?"

"Get lost, I said."

Thorby dropped a coin on the counter, picked up a bellfruit and

walked away, sucking the juice. He did not hurry.

A cautious reconnaissance showed him that police were staked out all through the ruins. At one entrance a group of ragged troglodytes huddled sadly under the eye of a patrolman. Baslim had estimated that at least five hundred people lived in the underground ruins. Thorby had not quite believed it, as he had rarely seen anyone else enter or heard them inside. He recognized only two faces among the prisoners.

A half hour later and more worried every minute Thorby located an entrance which the police did not seem to know. He scanned it for several minutes, then darted from behind a screen of weeds and was down it. Once inside he got quickly into total darkness, then moved cautiously, listening. The police were supposed to have spectacles which let them see in the dark. Thorby wasn't sure this was true as he had always found darkness helpful in evading them. But he took no chances.

There were indeed police down below; he heard two of them and saw them by hand torches they carried—if snoopies could see in the dark these two did not seem equipped for it. They were obviously searching, stun guns drawn. But they were in strange territory where-as Thorby was playing his home field. A specialized spelcologist, he knew these corridors the way his tongue knew his teeth; he had been

finding his way through them in utter blackness twice a day for years.

At the moment they had him trapped; he kept just far enough ahead to avoid their torches, skirted a hole that reached down into the next level, went beyond it, ducked into a doorway and waited.

They reached the hole, eyed the narrow ledge Thorby had taken so casually in the dark, and one of them said, "We need a ladder."

"Oh, we'll find stairs or a chute." They turned back. Thorby waited, then went back and down the hole.

A few minutes later he was close to his home doorway. He looked and listened and sniffed and waited until he was certain that no one was close, then crept to the door and reached for the thumbhole in the lock. Even as he reached he knew that something was wrong.

The door was gone; there was just a hole.

He froze, straining every sense. There was an odor of strangers but it wasn't fresh and there was no sound of breathing. The only sound was a faint drip-drip in the kitchen.

Thorby decided that he just had to see. He looked behind him, saw no glimmer, reached inside for the light switch and turned it to "dim."

Nothing happened. He tried the switch in all positions, still no light. He went inside, avoided something chattering Baslim's neat livingroom, on into the kitchen, and reached for candles. They were not where they belonged but his hand encountered

one nearby; he found the match safe and lit the candle.

Ruin and wreckage!

Most of the damage seemed the sort that results from a search which takes no account of cost, aiming solely at speed and thoroughness. Every cupboard, every shelf had been spilled, food dumped on the floor. In the large room the mattresses had been ripped open, stuffing spilled out. But some of it looked like vandalism, unnecessary, pointless.

Thorby looked around with tears welling up and his chin quivering. But when he found, near the door, Pop's false leg, lying dead on the floor with its mechanical perfection smashed as if trampled by boots, he broke into sobs and had to put the candle down to keep from dropping it. He picked up the shattered leg, held it like a doll, sank to the floor and cradled it, rocking back and forth and moaning.

V

Thorby spent the next several hours in the black corridors outside their ruined home, near the first branching, where he would hear Pop if he came back but where Thorby would have a chance to duck if police showed up.

He caught himself dozing, woke with a start, and decided that he had to find out what time it was; it seemed as if he had been keeping vigil a week. He went back into their home, found a candle and lit it. But their only clock, a household

"Eternal," was smashed. No doubt the radioactive capsule was still reckoning eternity but the works were mute. Thorby looked at it and forced himself to think in practical terms.

If Pop were free, he would come back. But the police had taken Pop away. Would they simply question him and turn him loose?

No, they would not. So far as Thorby knew, Pop had never done anything to harm the Sargon—but he had known for a long time that Pop was not simply a harmless old beggar. Thorby did not know why Pop had done the many things which did not fit the idea of "harmless old beggar" but it was clear that the police knew or suspected. About once a year the police had "cleaned out" the ruins by dropping a few retch-gas bombs down the more conspicuous holes; it simply meant having to sleep somewhere else for a couple of nights. But this was a raid in force. They had intended to arrest Pop and they had been searching for something.

The Sargon's police operated on a concept older than justice; they assumed that a man was guilty, they questioned him by increasingly strong methods until he talked . . . methods so notorious that an arrested person was usually anxious to tell all before questioning started. But Thorby was certain that the police would get nothing out of Pop which the old man did not wish to admit.

Therefore the questioning would go on a long time.

They were probably working on

Pop this very minute. Thorby's stomach turned over.

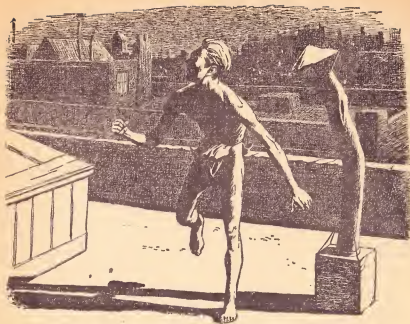
He had to get Pop away from them.

How? How does a moth attack the Praesidium? Thorby's chances were not much better. Baslim might be in a back room of the district police barracks, the logical place for a petty prisoner. But Thorby had an unreasoned conviction that Pop was not a petty prisoner—in which case he might be anywhere, even in the bowels of the Praesidium.

Thorby could go to the district police office and ask where his patron had been taken—but such was the respect in which the Sargon's police were held that this solution did not occur to him; had he presented himself as next of kin of a prisoner undergoing interrogation Thorby would have found himself in another closed room being interviewed by the same forceful means as a check on the answers—or lack of them—which were being wrung out of Baslim.

Thorby was not a coward; he simply knew that one does not dip water with a knife. Whatever he did for Pop would have to be done indirectly. He could not demand his "rights" because he had none; the idea never entered his head. Bribery was possible—for a man with a poke full of stellars. Thorby had less than two minims. Stealth was all that was left and for that he needed information.

He reached this conclusion as soon as he admitted that there was no



reasonable chance that the police would turn Pop loose. But, on the wild chance that Baslim might talk his way free, Thorby wrote a note, telling Pop that he would check back the next day, and left it on a shelf they used as a mail drop. Then he left.

It was night when he stuck his head above ground. He could not decide whether he had been down in the ruins for half a day or a day and a half. It forced him to change plans; he had intended to go first to Inga the greengrocer and find out what she knew. But at least there were no police around now; he

could move freely as long as he evaded the night patrol. But where? Who could, or would, give him information?

Thorby had dozens of friends and knew hundreds by sight. But his acquaintances were subject to curfew; he saw them only in daylight and in most cases did not know where they slept. But there was one neighborhood which was not under curfew; Joy Street and its several adjoining courts never closed. In the name of commerce and for the accommodation of visiting spacemen taprooms and gaming halls and other places of hospitality to strangers in that area near the spaceport never

closed their doors. A commoner, even a freedman, might stay up all night there, although he could not leave between curfew and dawn without risking being picked up.

This risk did not bother Thorby; he did not intend to be seen and, although it was patrolled inside, he knew the habits of the police there. They traveled in pairs and stayed on lighted streets, leaving their beats only to suppress noisy forms of lawbreaking. But the virtue of the district, for Thorby's purpose, was that the gossip there was often hours ahead of the news as well as covering matters ignored or suppressed by licensed news services.

Someone on Joy Street would know what had happened to Pop.

Thorby got into the honky-tonk neighborhood by scrambling over roof tops. He went down a drain into a dark court, moved along it to Joy Street, stopped short of the street lights, looked up and down for police and tried to spot someone he knew. There were many people about but most of them were strangers on the town. Thorby knew every proprietor and almost every employee up and down the street but he hesitated to walk into one of the joints; he might walk into the arms of police. He wanted to spot someone he trusted, whom he could motion into the darkness of the court.

No police but no friendly faces, either—just a moment; there was Auntie Singham.

Of the many fortunetellers who worked Joy Street Auntie Singham

was the best; she never purveyed anything but good fortune. If these things failed to come to pass, no customer ever complained; Auntie's warm voice carried conviction. Some whispered that she improved her own fortunes by passing information to the police, but Thorby did not believe it because Pop did not. She was a likely source of news and Thorby decided to chance it—the most she could tell the police was that he was alive and on the loose . . . which they knew.

Around the corner to Thorby's right was the Port of Heaven cabaret; Auntie was spreading her rug on the pavement there, anticipating customers spilling out at the end of a performance now going on.

Thorby glanced each way and hurried along the wall almost to the cabaret. "*Pss!* Auntie!"

She looked around, looked startled, then her face became expressionless. Through unmoving lips she said, loud enough to reach him, "Beat it, son! Hide! Are you crazy?"

"Auntie . . . *where have they got him?*"

"Crawl in a hole and pull it in after you. There's a reward out!"

"For *me*? Don't be silly, Auntie; nobody would pay a reward for me. Just tell me where they're holding him. Do you know?"

"They're not."

"'They're not' what?"

"You don't know? Oh, poor lad! They've shortened him."

Thorby was so shocked that he was speechless. Although Baslim had talked of the time when he would be dead, Thorby had never really believed in it; he was incapable of imagining Pop dead and gone.

He missed her next words; she had to repeat. "Snoopers! Get out!"

Thorby glanced over his shoulder. Two patrolmen, moving this way—time to leave! But he was caught between street and blank wall, with no bolt hole but the entrance to the cabaret . . . if he ducked in there, dressed as he was, being what he was, the management would simply shout for the patrol.

But there was nowhere else to go. Thorby turned his back on the police and went inside the narrow foyer of the cabaret. There was no one there; the last act was in progress and even the hawker was not in sight. But just inside was a ladder-stool and on it was a box of transparent letters used to change signs billing the entertainers. Thorby saw them and an idea boiled up that would have made Baslim proud of his pupil—Thorby grabbed the box and stool and went out again.

He paid no attention to the approaching policemen, placed the ladder-stool under the little lighted marquee that surmounted the entrance and jumped up on it, with his back to the patrolmen. It placed most of his body in bright light but his head and shoulders stuck up into the shadow above the row of lights. He began methodically to re-

move letters spelling the name of the star entertainer.

The two policemen reached a point right behind him. Thorby tried not to tremble and worked with the steady listlessness of a hired hand with a dull job. He heard Auntie Singham call out, "Good evening, Sergeant."

"Evening, Auntie. What lies are you telling tonight?"

"Lies indeed! I see a sweet young girl in your future, with hands graceful as birds. Let me see your palm and perhaps I can read her name."

"What would my wife say? No time to chat tonight, Auntie." The sergeant glanced at the workman changing the sign, rubbed his chin and said, "We've got to stay on the prowl for Old Baslim's brat. You haven't seen him?" He looked again at the work going on above him and his eyes widened slightly.

"Would I sit here swapping gossip if I had?"

"Hm-m-m . . ." He turned to his partner. "Roj, move along and check Ace's Place, and don't forget the washroom. I'll keep an eye on the street."

"O.K., Sarge."

The senior patrolman turned to the fortuneteller as his partner moved away. "It's a sad thing, Auntie. Who would have believed that old Baslim could have been spying against the Sargon and him a cripple?"

"Who indeed?" She rocked forward. "Is it true that he died of

fright before they shortened him?"

"He had poison ready, knowing what was coming. But dead he was, before they pulled him out of his hole. The captain was furious."

"If he was dead already, why shorten him?"

"Come, come, Auntie, the law must be served. Shorten him they did, though it's not a job I'd relish." The sergeant sighed. "It's a sad world, Auntie. Think of that poor boy, led astray by that old rascal—and now the captain and the commandant both want to ask the lad questions they meant to ask the old man."

"What good will that do them?"

"None, likely." The sergeant poked gutter filth with the butt of his staff. "But if I were the lad, knowing the old man is dead and not knowing any answers to difficult questions, I'd be far, far from here already. I'd find me a farmer a long way from the city, one who needed willing hands cheap and took no interest in the troubles of the city. But since I'm not, why then, as soon as I clap eyes on him, if I do, I'll arrest him and haul him up before the captain."

"He's probably hiding between rows in a bean field this minute, trembling with fright."

"Likely. But that's better than walking around with no head on your shoulders." The police sergeant looked down the street, called out, "O.K., Roj. Right with you." As he started away he glanced again at Thorby and said, "Night, Auntie.

If you see him, shout for us."

"I'll do that. Hail to the Sargon."

"Hail."

Thorby continued to pretend to work and tried not to shake, while the police moved slowly away. Customers trickled out of the cabaret and Auntie took up her chant, promising fame, fortune, and a bright glimpse of the future, all for a coin. Thorby was about to get down, stick the gear back into the entranceway and get lost, when a hand grabbed his ankle.

"What are you doing!"

Thorby froze, then realized it was just the manager of the place, angry at finding his sign disturbed. Without looking down Thorby said, "What's wrong? You paid me to change this blinker."

"I did?"

"Why, sure, you did. You told me—" Thorby glanced down, looked amazed and blurted, "You're not the one."

"I certainly am not. Get down from there."

"I can't. You've got my ankle."

The man let go and stepped back as Thorby climbed down. "I don't know what silly idiot could have told you—" He broke off as Thorby's face came into light. "Hey, it's that beggar boy!"

Thorby broke into a run as the man grabbed for him. He went ducking in and out between pedestrians as the shout of, "Patrol! Patrol! *Police!*" rose behind him. Then he was in the dark court again

and, charged with adrenalin, was up a drainpipe as if it had been level pavement. He did not stop until he was several dozen roofs away.

He sat down against a chimney pot, caught his breath and tried to think.

Pop was dead. He couldn't be but he was. Old Poddy wouldn't have said so if he hadn't known. Why . . . why, Pop's head must be on a spike down at the pylon this minute, along with the other losers. Thorby had one grisly flash of visualization, and at last collapsed, wept uncontrollably.

After a long time he raised his head, wiped his face with knuckles, and straightened up.

Pop was dead. All right, what did he do now?

Anyhow, Pop had beat them out of questioning him. Thorby felt bitter pride.

Pop was always the smart one; they had caught him but Pop had had the last laugh.

Well, what *did* he do now?

Auntie Singham had warned him to hide. Poddy had said, plain as anything, to get out of town. Good advice—if he wanted to stay as tall as he was, he had better be outside the city before daylight. Pop would expect him to put up a fight, not sit still and wait for the snoopies, and there was nothing left that he could do for Pop, now that Pop was dead—*bold it!*

"*When I'm dead, you are to look up a man and give him a message.*

Can I depend on you? Not goof off and forget it?"

Yes, Pop, you can! I didn't forget—I'll deliver it! Thorby recalled for the first time in more than a day why he had come home early: Starship *Sisu* was in port; her skipper was on Pop's list. "*The first one who shows up*"—that's what Pop had said. I didn't goof, Pop; I almost did, but I remembered. I'll do it, I'll do it! Thorby decided with fierce resurgence that this message must be the final, important thing that Pop had to get out—since they said he was a spy. All right, he'd help Pop finish his job. "I'll do it, Pop. You'll have the best of them yet!"

Thorby felt no twinge at the "treason" he was about to attempt; shipped in as a slave against his will, he felt no loyalty to the Sargon and Baslim had never tried to instill any. His strongest feeling toward the Sargon was superstitious fear and even that washed away in the violence of his need for revenge. He feared neither police nor Sargon himself; he simply wanted to evade them long enough to carry out Baslim's wishes. After that . . . well, if they caught him, he hoped to have finished the job before they shortened him.

If the *Sisu* were still in port—

Oh, she had to be! But the first thing was to find out for sure that the ship had not left, then—no, the first thing was to get out of sight before daylight. It was a million times more important to stay clear

of the snoopies now that he had it through his thick head that there was something he could do for Pop.

Get out of sight, find out if the *Sissu* was still dirtside, get a message to her skipper—and do all this with every patrolman in the district looking for him.

Maybe he had better work his way over to the shipyards, where he was not known, sneak inside and back the long way to the port and find the *Sissu*. No, that was silly; he had almost been caught over that way just from not knowing the layout. Here, at least, he knew every building, most of the people.

But he had to have help. He couldn't go on the street, stop spacemen and ask. Who was a close enough friend to help—at risk of trouble with police? Ziggy? Don't be silly; Ziggy would turn him in for the reward, for two minims Ziggy would sell his own mother—Ziggy thought that anyone who didn't look out for number one first, last, and always, was a sucker.

Who else? Thorby came up against the hard fact that most of his friends were around his age and as limited in resources. Most of them he did not know how to find at night, and he certainly could not hang around in daylight and wait for one to show up. As for the few who lived with their families at known addresses, he could not think of one who could both be trusted and could keep parents concerned from tipping off the police. Most honest citizens at Thorby's

level went to great lengths to mind their own business and stay on the right side of the police.

It had to be one of Pop's friends.

He ticked off this list almost as quickly. In most cases he could not be sure how binding the friendship was, blood brotherhood or merely acquaintance. The only one whom he could possibly reach and who might possibly help was Mother Shaum. She had sheltered them once when they were driven out of their cave with retch gas and she had always had a kind word and a cold drink for Thorby.

He got moving; daylight was coming.

Mother Shaum's place was a tap-room and lodging house, on the other side of Joy Street and near the crewmen's gate to the spaceport. Half an hour later, having crossed many roofs, twice been up and down in side courts and once having ducked across the lighted street, Thorby was on the roof of her place. He had not dared walk in her door; too many witnesses would force her to call the patrol. He had considered the back entrance and had squatted among garbage cans before deciding that there were too many voices in the kitchen.

But when he did reach her roof, he was almost caught by daylight; he found the usual access to the roof but he found also that its door and lock were sturdy enough to defy bare-handed burglary.

He went to the rear with the

possibility in mind of going down, trying the back door anyhow; it was almost dawn and becoming urgent to get under cover. As he looked down the back he noticed ventilation holes for the low attic, one on each side. They were barely as wide as his shoulders, as deep as his chest—but they led inside.

They were screened but a few minutes and many scratches later he had one kicked in. Then he tried the unlikely task of easing himself over the edge feet first and snaking into the hole. He got in as far as his hips, his clout caught on raw edges of screening and he stuck like a cork, lower half inside the house, chest and head and arms sticking out like a gargoyle. He could not move and the sky was getting lighter.

With a drag from his heels and sheer force of will the cloth parted and he moved inside, almost knocking himself out by banging his head. He lay still and caught his breath, then pushed the screening untidily back into place. It would no longer stop vermin but it might fool the eye from four stories down. It was not until then that he realized that he had almost fallen those four stories.

The attic was no more than a crawl space; he started to explore on hands and knees for the fixture he believed must be here: a scuttle hole for repairs or inspection. Once he started looking and failed to find it, he was not sure that there was such a thing—he knew that some houses had them but he did not

know much about houses; he had not lived in them much.

He did not find it until sunrise striking the vent holes gave illumination. It was all the way forward, on the street side.

And it was bolted from underneath.

But it was not as rugged as the door to the roof. He looked around, found a heavy spike dropped by a workman and used it to dig at the wooden closure. In time he worked a knot loose, stopped and peered through the knothole.

There was a room below; he saw a bed with one figure in it.

Thorby decided that he could not expect better luck; only one person to cope with, to persuade to find Mother Shaum without raising an alarm. He took his eye away, put a finger through and felt around; he touched the latch, then gladly broke a fingernail easing the bolt back. Silently, he lifted the trap door.

The figure in the bed did not stir.

He lowered himself, hung by his fingertips, dropped the remaining short distance and collapsed as noiselessly as possible.

The person in bed was sitting up with a gun aimed at him. "It took you long enough," she said. "I've been listening to you for the past hour."

"Mother Shaum! Don't shoot!"

She leaned forward, looked closely. "Baslim's kid!" She shook her head. "Boy, you're a mess—and you're hotter than a fire in a mat-

tress, too. What possessed you to come here?"

"I didn't know where else to go."

She frowned. "I suppose that's a compliment . . . though I had rather have had a plague of boils, if I'd uv had my druthers." She got out of bed in her nightdress, big bare feet slapping on the floor, and peered out the window at the street below. "Snoopies here, snoopies there, snoopies checking every joint in the street three times in one night and scaring my customers . . . boy, you've caused more hooraw than I've seen since the factory riots. Why didn't you have the kindness to drop dead?"

"You won't hide me, Mother?"

"Who said I wouldn't? I've never gone out of my way to turn anybody in yet. But I don't have to like it." She glowered at him. "When did you eat last?"

"Uh, I don't remember."

"I'll scare you up something. I don't suppose you can pay for it?" She looked at him sharply.

"I'm not hungry. Mother Shaum, is the *Sisu* still in port?"

"Huh? I don't know. Yes, I do; she is—a couple of her boys were in earlier tonight. Why?"

"I've got to get a message to her skipper. I've got to see him, I've just *got* to!"

She gave a moan of utter exasperation. "First he wakes a decent working woman out of her first sleep of the night, he plants himself on her at rare risk to her life and limb and license. He's filthy dirty and

scratched and bloody and no doubt will be using my clean towels with laundry prices the way they are. He hasn't eaten and can't pay for his tucker—and now he adds insult to injury by demanding that I run *errands* for him!"

"I'm not hungry—and it doesn't matter whether I wash or not. But I've *got* to see Captain Krausa."

"Don't be giving me orders in my own bedroom. Overgrown and unspanked, you are, if I knew that old scamp you lived with. You'll have to wait until one of the *Sisu*'s lads shows up later in the day, so's I can get a note out to the captain." She turned toward the door. "Water's in the jug, towel's on the rack, pot's under the bed. Mind you get clean." She left.

Washing did feel good and Thorby found astringent powder on her dressing table, dusted his scratches. She came back, slapped two slices of bread with a generous slab of meat between them in front of him, added a bowl of milk, left without speaking. Thorby hadn't thought that it was possible to eat, with Pop dead, but found that it was—he had quit worrying when he first saw Mother Shaum.

She came back. "Gulp that last bite and in you go. The word is they're going to search every house."

"Huh? Then I'll get out and run for it."

"Shut up and do as I say. In you go now."

"In where?"

"In there," she answered, pointing.

"In that?" It was a built-in window seat and chest, in a corner; its shortcoming lay in its size, it being as wide as a man but less than a third as long. "I don't think I can fold up that small."

"And that's just what the snoopies will think. Hurry." She lifted the lid, dug out some clothing, lifted the far end of the box at the wall adjoining the next room as if it were a sash, and disclosed thereby that a hole went on through the wall. "Scoot your legs through—and don't think you are the only one who has ever needed to lie quiet."

Thorby got into the box, slid his

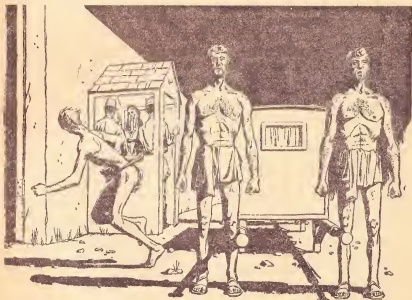
legs through the hole, lay back; the lid when closed would be a few inches above his face. Mother Shaum threw clothing on top of him, concealing him. "You O.K.?"

"Yeah, sure. Mother Shaum? Is he really dead?"

Her voice became almost gentle. "He is, lad. A great shame it is, too."

"You're sure?"

"I was bothered by the same doubt, knowing him so well. So I took a walk down to the pylon to see. He is. But I can tell you this, lad, he's got a grin on his face like he'd outsmarted them—and he had, too. They don't like it when a man doesn't wait to be questioned." She



sighed again. "Cry now, if you need, but be quiet. If you hear anyone, don't even breathe."

The lid slammed. Thorby wondered whether he would be able to breathe at all, but found that there must be air holes; it was stuffy but bearable. He turned his head to get his nose clear of cloth resting on it.

Then he did cry, after which he went to sleep.

He was awakened by voices and footsteps, recalled where he was barely in time to keep from sitting up. The lid above his face opened, and then slammed, making his ears ring; a man's voice called out, "Nothing in this room, Sarge!"

"We'll see." Thorby recognized Poddy's voice. "You missed that scuttle up there. Fetch the ladder."

Mother Shaum's voice said, "Nothing up there but the breather space, Sergeant."

"I said, 'We'd see.'"

A few minutes later he added, "Hand me the torch. Hm-m-m. You're right, Mother—but he has been here."

"Huh?"

"Screen broken back at the end of the house and dust disturbed. I think he got in this way, came down through your bedroom, and out."

"Saints and devils! I could have been murdered in my bed! Do you call that police protection?"

"You're not hurt. But you'd better have that screen fixed, or you'll have snakes and all their cousins living with you." He paused. "It's

my thought he tried to stay in the district, found it too hot, and went back to the ruins. If so, no doubt we'll gas him out before the day is over."

"Do you think I'm safe to go back to my bed?"

"Why should he bother an old sack of suet like you?"

"What a nasty thing to say! And just when I was about to offer you a drop to cut the dust."

"You were? Let's go down to your kitchen, then, and we'll discuss it. I may have been wrong." Thorby heard them leave, heard the ladder being removed. At last he dared breathe.

Later she came back, grumbling, and opened the lid. "You can stretch your legs. But be ready to jump back in. Three pints of my best. Policemen!"

VI

The skipper of the *Sisu* showed up that evening. Captain Krausa was tall, fair, rugged and had the worry wrinkles and grim mouth of a man used to authority and responsibility. He was irked with himself and everyone for having allowed himself to be lured away from his routine by nonsense. His eye assayed Thorby unflatteringly. "Mother Shaum, is *this* the person who insisted that he had urgent business with me?"

The captain spoke Nine Worlds trade lingo, a degenerate form of Sargonese, uninflected and with a

rudimentary positional grammar. But Thorby understood it. He answered, "If you are Captain Fjalar Krausa, I have a message for you, noble sir."

"Don't call me 'noble sir;' I'm Captain Krausa, yes."

"Yes, nob . . . yes, captain."

"If you have a message, give it to me."

"Yes, captain." Thorby started reciting the message he had memorized, using the Suomish version to Krausa: "To Captain Fjalar Krausa, master of Starship *Sisu* from Baslim the Cripple: Greetings, old friend! Greetings to your family, clan, and sib, and my humblest respects to your revered mother. I am speaking to you through the mouth of my adopted son. He does not understand Suomic; I address you privately. When you receive this message, I am already dead—"

Krausa had started to smile; now he let out an exclamation. Thorby stopped. Mother Shaum interrupted with, "What's he saying? What language is that?"

Krausa brushed it aside. "It's my language. Is what he says true?"

"Is what true? How would I know? I don't understand that yammer."

"Uh . . . sorry, sorry! He tells me that an old beggar who used to hang around the Plaza—'Baslim' he called himself—is dead. Is this true?"

"Eh? Of course it is. I could have told you, if I had known you were interested. Everybody knows it."

"Everybody but me, apparently. What happened to him?"

"He was shortened."

"Shortened? *Why*?"

She shrugged. "How would I know? The word is, he died or poisoned himself, or something, before they could question him—so how would I know? I'm just a poor old woman, trying to make an honest living, with prices getting higher every day. The Sargon's police don't confide in *me*."

"But if . . . never mind. He managed to cheat them, did he? It sounds like him." He turned to Thorby. "Go on. Finish your message."

Thorby, thrown off stride, had to go back to the beginning. Krausa waited impatiently until he reached: ". . . I am already dead. My son is the only thing of value of which I die possessed; I entrust him to your care. I ask that you succor and admonish him as if you were I. When opportunity presents, I ask that you deliver him to the commander of any vessel of the Hegemonic Guard, saying that he is a distressed citizen of the Hegemony and entitled as such to their help in locating his family. If they will bestir themselves, they can establish his identity and restore him to his people. All the rest I leave to your good judgment. I have enjoined him to obey you and I believe that he will; he is a good lad, within the limits of his age and experience, and I entrust him to you with a serene heart. Now I must depart.

My life has been long and rich; I am content. Farewell."

The captain chewed his lip and his face worked in the fashion of a grown man who is busy not crying. Finally he said gruffly, "That's clear enough. Well, lad, are you ready?"

"Sir?"

"You're coming with me. Or didn't Baslim tell you?"

"No, sir. But he told me to do whatever you told me to. I'm to come with you?"

"Yes. How soon can you leave?"

Thorby gulped. "Right now, sir."

"Then come on. I want to get back to my ship." He looked Thorby up and down. "Mother Shaum, can we put some decent clothes on him? That outlandish rig won't do to come aboard in. Or never mind; there's a slop shop down the street; I'll pick him up a kit."

She had listened with growing amazement. Now she said, "You're taking him to your ship?"

"Any objections?"

"Huh? Not at all . . . if you don't care if they rack him apart."

"What do you mean?"

"Are you crazy? There are six snoopers between here and the spaceport gate—and each one anxious to pick up the reward."

"You mean he's wanted?"

"Why do you think I've hidden him in my own bedroom? He's as hot as bubbling cheese."

"But why?"

"Again, how would I know? He is."

"You don't really think that a lad like this would know enough about what old Baslim was doing to make it worth—"

"Let's not speak of what Baslim was doing or did. I'm a loyal subject of the Sargon—with no wish to be shortened. You say you want to take the boy into your ship. I say, 'Fine!' I'll be happy to be quit of the worry. But *how*?"

Krausa cracked his knuckles one by one. "I had thought," he said slowly, "that it would be just a matter of walking him down to the gate and paying his emigration tax."

"It's not, so forget it. Is there any way to get him aboard without passing him through the gate?"

Captain Krausa looked worried. "They're so strict about smuggling here that if they catch you, they confiscate the ship. You're asking me to risk my ship . . . and myself . . . and my whole crew."

"I'm not asking you to risk anything. I've got myself to worry about. I was just telling you the straight score. If you ask me, I'd say you were crazy to attempt it."

Thorby said, "Captain Krausa—"

"Eh? What is it, lad?"

"Pop told me to do as you said—but I'm sure he never meant you to risk your neck on my account." He swallowed. "I'll be all right."

Krausa sawed the air impatiently. "No, no!" he said harshly. "Baslim wanted this done—and debts are paid. Debts are always paid!"

"I don't understand."

"No need for you to. But Baslim wanted me to take you with me, so that's how it's got to be." He turned to Mother Shaum. "The question is, how? Any ideas?"

"Possibly. Let's go talk it over." She turned. "Get back in your hide-away, Thorby, and be careful. I may have to go out for a while."

Shortly before curfew the next day a large sedan chair left Joy Street. A patrolman stopped it and Mother Shaum stuck her head out. He looked surprised. "Going out, Mother? Who'll take care of your customers?"

"Mura has the keys," she answered. "But keep an eye on the place, that's a good friend. She's not as firm with them as I am." She put something in his hand and he made it disappear.

"I'll do that. Going to be gone all night?"

"I hope not. Perhaps I had better have a street pass, do you think? I'd like to come straight home if I finish my business."

"Well, now, they've tightened up a little on street passes."

"Still looking for the beggar's boy?"

"As a matter of fact, yes. But we'll find him. If he's fled to the country, they'll starve him out; if he's still in town, we'll run him down."

"Well, you could hardly mistake me for him. So how about a short pass for an old woman who needs to make a private call?" She rested

her hand on the door; the edge of a bill stuck out.

He glanced at it and glanced away. "Is midnight-late enough?"

"Plenty, I should think."

He took out his book and started writing, tore out the form and handed it to her. As she accepted it the money disappeared. "Don't make it later than midnight."

"Earlier, I hope."

He glanced inside the sedan chair, then looked over her entourage. The four bearers had been standing patiently, saying nothing—which was not surprising, since they had no tongues. "Zenith Garage?"

"I always trade there."

"I thought I recognized them. Well matched."

"Better look them over. One of them might be the beggar's boy."

"Those great hairy brutes! Get along with you, Mother."

"Hail, Shol."

The chair swung up and moved away at a trot. As they rounded the corner she slowed them to a walk and drew all curtains. Then she patted the cushions billowing around her. "Doing all right?"

"I'm squashed," a voice answered faintly.

"Better squashed than shortened. I'll ease over a bit. Your lap is bony."

For the next mile she was busy modifying her costume, and putting on jewels. She veiled her face until only her live, black eyes showed. Finished, she stuck her head out and

called instructions to the head porter; the chair swung right toward the spaceport. When they reached the road girdling its high, impregnable fence it was almost dark.

The gate for spacemen is at the foot of Joy Street, the gate for passengers is east of there in the Emigration Control Building. Beyond that, in the warehouse district, is Traders' Gate—freight and outgoing customs. Miles beyond are shipyard gates. But between the shipyards and Traders' Gate is a small gate reserved for nobles rich enough to own space yachts.

The chair reached the spaceport fence short of Traders' Gate, turned and went along the fence toward it. Traders' Gate is several gates, each a loading dock built through the barrier, so that a warehouse truck can back up, unload; the Sargon's inspectors can weigh, measure, grade, prod, open, and ray the merchandise, as may be indicated, before it is slid across the dock into spaceport trucks on the other side, to be delivered to waiting ships.

This night dock-three of the gate had its barricade open; Free Trader *Sisu* was finishing loading. Her master watched, arguing with inspectors, and oiling their functioning in the immemorial fashion. A ship's junior officer helped him, keeping tally with pad and pencil.

The sedan chair weaved among waiting trucks and passed close to the dock. The master of the *Sisu* looked up as the veiled lady in the chair peered out at the activity. He

glanced at his watch and spoke to his junior officer. "One more load, Jan. You go in with the loaded truck and I'll follow with the last one."

"Aye aye, sir." The young man climbed on the tail of the truck and told the driver to take it away. An empty truck pulled into its place. It loaded quickly as the ship's master seemed to find fewer things to argue about with the inspectors. Then he was not satisfied and demanded that it be done over. The boss stevedore was pained but the master soothed him, glanced at his watch again and said, "There's time. I don't want these crates cracked before we get them into the ship; the stuff costs money. So let's do it right."

The sedan chair had moved on along the fence. Shortly it was dark; the veiled lady looked at the glowing face of her finger watch and urged her bearers into a trot.

They came at last to the gate reserved for nobles. The veiled lady leaned her head out and snapped, "Open up!"

There were two guards on the gate, one in a little watch room, the other lounging outside. The one outside opened the gate, but placed his staff across it when the sedan chair started to go through. Stopped, the bearers lowered it to the ground with the righthand or door side facing into the gate.

The veiled lady called out, "Clear the way, you! Lord Marlin's yacht."

The guard blocking the gate hesitated. "My lady has a pass?"

"Are you a fool?"

He was not a fool; he knew that noble ladies in hired plain chairs did not care to show passes identifying them when going to visit private yachts of noble gentlemen.

"If my lady has no pass," he said slowly, "perhaps my lady will suggest some way to assure the guard that My Lord Marlin is expecting her?"

The veiled lady was a voice in the dark—the guard had sense enough not to shine a light in her face; he had long experience with nobles and gentry. But the voice was an angry one, it bubbled and fumed. "If you insist on being a fool, call my lord at his yacht! Phone him—and I trust you'll find you've pleased him!"

The guard in the watch room came out. "Trouble, Sean?"

"Uh, no." They held a whispered consultation. The junior went inside to phone Lord Marlin's yacht, while the other waited outside.

But it appeared that the lady had had all the nonsense she was willing to endure. She threw open the door of the chair, burst out, and stormed into the watch room with the other startled guard after her. The one making the call stopped punching keys with connection uncompleted and looked up—and felt sick. This was even worse than he had thought. This was no flighty young girl, escaped from her chaperones; this was an angry dowager, the sort with enough influence to break a man to common labor or worse—with a

temper that made her capable of it. He listened open-mouthed to the richest tongue-lashing it had been his misfortune to endure in all the years he had been checking lords and ladies through their gate.

While the attention of both guards was monopolized by Mother Shaum's rich rhetoric, a figure detached itself from the sedan chair, faded through the gate and kept going, until it was lost in the gloom of the field. As Thorby ran, even as he expected the burning tingle of a stun gun bolt in his guts, he watched for a road on the right joining the one from the gate. When he came to it he threw himself down and lay panting.

Back at the gate, Mother Shaum stopped for breath. "My lady," one of them said placatingly, "if you will just let us complete the call—"

"Forget it! No, *remember* it!—for tomorrow you'll hear from My Lord Marlin." She flounced back to her chair.

"Please, my lady!"

She ignored them, spoke sharply to the slaves; they swung the chair up, broke into a trot. One guard's hand went to his belt, as a feeling of something badly wrong possessed him. But his hand stopped. Right or wrong, knocking down a lady's bearer was not to be risked.

And, after all, she hadn't actually done anything wrong.

When the master of the *Sisu* finally O.K.'d the loading of the last truck, he climbed onto its bed,

waved the driver to start, then worked his way forward. "Hey, there!" He knocked on the back of the cab.

"Yes, captain?" The driver's voice came through faintly.

"There's a stop sign where this road joins the one out to the ships. I notice most of you drivers don't bother with it."

"That one? There's never any traffic on that road. That road is a stop just because the nobles use it."

"That's what I mean. One of them might pop up and I'd miss my jump time just for a silly traffic accident with one of your nobles. They could hold me here for many ninedays. So come to a full stop, will you?"

"Whatever you say, captain. You're paying the bill."

"So I am." A half stellar note went through a crack in the cab.

When the truck slowed, Krausa went to the tail gate. As it stopped he reached down and snaked Thorby inside. "Quiet!" Thorby nodded and trembled. Krausa took tools from his pockets, attacked one of the crates. Shortly he had one side open, burlap pulled back, and he started dumping verga leaves, priceless on any other planet. Soon he had a largish hole and a hundred pounds of valuable leaves were scattered over the plain. "Get in!"

Thorby crawled into the space, made himself small. Krausa pulled burlap over him, sewed it, crimped slats back into place, and finished by strapping it and sealing it with

a good imitation of the seal used by the inspectors—it was a hand-crafted product of his ship's machine shop. He straightened up and wiped sweat from his face. The truck was turning into the loading circle for the *Sisu*.

He supervised the final loads himself, with the Sargon's field inspector at his elbow, checking off each crate, each bale, each carton as it went into the sling. Then Krausa thanked the inspector appropriately and rode the sling up instead of the passenger hoist. Since a man was riding it, the hoist man let down the sling with more than usual care. The hold was almost filled and stowed for jump; there was very little head room. Crewmen started wrestling crates free of the sling and even the captain lent a hand, at least to the extent of one crate. Once the sling was dragged clear, they closed the cargo door and started dogging it for space. Captain Krausa reached into his pocket again and started tearing open that crate.

Two hours later Mother Shaum stood at her bedroom window and looked out across the spaceport. She glanced at her watch. A green rocket rose from the control tower; seconds later a column of white light climbed to the sky. When the noise reached her, she smiled grimly and went downstairs to supervise the business—Mura couldn't really handle it properly alone.

TO BE CONTINUED

THE ANALYTICAL LABORATORY

Since we have some space for the Lab this month, I'll repeat for the benefit of new readers the system on which the Lab works.

Reader's votes for the stories are tabulated, a vote for story A as best-in-the-issue gives it a 1, while a fifth-place vote gives it a 5. The story-vote total is added up at the time this department is made up, and divided by the number of voters, to yield the point-score. In the slightly miraculous event that a story got voted first place by every reader voting, its point score would be 1.00.

Our authors follow the An Lab with genuine interest; we have a bonus system. Each month, the story voted into first place gets a 1¢ bonus above our base payment rate of 3¢ per word. Poul Anderson's story, "Among Thieves" this issue won first place; Anderson gets a 1¢ per word added payment.

"Needler," by Randall Garrett took second place; that carries a ½¢ a word bonus.

Your reader votes, therefore, are of direct interest to the authors . . . as well as to me. You can do the author who gives you a satisfying story the return favor of giving him a bonus for a good job—and, in doing so, suggest to authors generally that *that's* the sort of thing you like.

The voting for the June 1957 issue came out this way:

PLACE	STORY	AUTHOR	POINTS
1.	Among Thieves	Poul Anderson	1.86
2.	Needler	Randall Garrett	2.13
3.	Ribbon In The Sky	Murray Leinster	2.53
4.	Drift	A. Bertram Chandler	3.61

THE EDITOR.

IN TIMES TO COME

Next issue, in addition to Part II of Bob Heinlein's "Citizen of the Galaxy," we have another Murray Leinster yarn, "The Grandfathers' War." Thorby succeeds in graduating from the slave of a one-eyed, one-legged beggar to membership among the Free Traders . . . which certainly *looks* like a great increase in freedom. Hah! He'll find out!

In "The Grandfathers' War," one of the Med Service ships gets caught in the middle of the daggondest mess of an all-out family fight you ever heard of. A whole planet full of teen-age kids engaged in a genuine, all-out war with the planetful of their fathers and grandfathers—which was a practically inevitable result of a seemingly sound effort to solve an inescapable problem. Like most intra-family feuds, the fight was anything but one an outsider would be happy to be caught in . . . !

THE EDITOR.



INTO YOUR TENT I'LL CREEP

*Who was it said "God protect me from my friends;
I can take care of my enemies!" I wonder? A friend
is much harder to fight, when it comes down to it. . . .*

BY ERIC FRANK RUSSELL

Morfad sat in the midship cabin and gloomed at the wall. He was worried and couldn't conceal the fact. The present situation had the frustrating qualities of a gigantic rattrap. One could escape it only

with the combined help of all the other rats.

But the others weren't likely to lift a finger either on his or their own behalf. He felt sure of that. How can you persuade people to try

escape a jam when you can't convince them that they're in it, right up to the neck?

A rat runs around a trap only because he is grimly aware of its existence. So long as he remains blissfully ignorant of it, he does nothing. On this very world a horde of intelligent aliens had done nothing about it through the whole of their history. Fifty skeptical Altairans weren't likely to step in where three thousand million Terrans had failed.

He was still sitting there when Haraka came in and informed, "We leave at sunset."

Morfad said nothing.

"I'll be sorry to go," added Haraka. He was the ship's captain, a big, burly sample of Altairan life. Rubbing flexible fingers together, he went on, "We've been lucky to discover this planet, exceedingly lucky. We've become blood brothers of a life-form fully up to our own standard of intelligence, space-traversing like ourselves, friendly and cooperative."

Morfad said nothing.

"Their reception of us has been most cordial," Haraka continued enthusiastically. "Our people will be greatly heartened when they hear our report. A great future lies before us, no doubt of that. A Terran-Altairan combine will be invincible. Between us we can explore and exploit the entire galaxy."

Morfad said nothing.

Cooling down, Haraka frowned at him. "What's the matter with you, Miscry?"

"I am not overjoyed."

"I can see that much. Your face resembles a very sour *shamsid* on an aged and withered bush. And at a time of triumph, too! Are you ill?"

"No." Turning slowly, Morfad looked him straight in the eyes. "Do you believe in psionic faculties?"

Haraka reacted as if caught on one foot. "Well, I don't know. I am a captain, a trained engineer-navigator, and as such I cannot pretend to be an expert upon extraordinary abilities. You ask me something I am not qualified to answer. How about you? Do you believe in them?"

"I do—*now*."

"Now? Why now?"

"The belief has been thrust upon me." Morfad hesitated, went on with a touch of desperation. "I have discovered that I am telepathic."

Surveying him with slight incredulity, Haraka said, "You've discovered it? You mean it has come upon you recently?"

"Yes."

"Since when?"

"Since we arrived on Terra."

"I don't understand this at all," confessed Haraka, baffled. "Do you assert that some peculiarity in Terra's conditions has suddenly enabled you to read my thoughts?"

"No, I cannot read your thoughts."

"But you've just said that you have become telepathic."

"So I have. I can hear thoughts as clearly as if the words were being

shouted aloud. But not your thoughts nor those of any member of our crew."

Haraka leaned forward, his features intent. "Ah, you have been hearing *Terran* thoughts, eh? And what you've heard has got you bothered? Morfad, I am your captain, your commander. It is your bounden duty to tell me of anything suspicious about these Terrans." He waited a bit, urged impatiently, "Come on, speak up!"

"I know no more about these humanoids than you do," said Morfad. "I have every reason to believe them genuinely friendly but I don't know what they think."

"But by the stars, man, you—"

"We are talking at cross-purposes," Morfad interrupted. "Whether I do or do not overhear Terran thoughts depends upon what one means by Terrans."

"Look," said Haraka, "whose thoughts *do* you hear?"

Steeling himself, Morfad said flatly, "Those of Terran dogs."

"Dogs?" Haraka lay back and stared at him. "*Dogs?* Are you serious?"

"I have never been more so. I can hear dogs and no others. Don't ask me why because I don't know. It is a freak of circumstance."

"And you have listened to their minds ever since we jumped to Earth?"

"Yes."

"What sort of things have you heard?"

"I have had pearls of alien wis-

dom cast before me," declared Morfad, "and the longer I look at them the more they scare hell out of me."

"Get busy frightening me with a few examples," invited Haraka, suppressing a smile.

"Quote: the supreme test of intelligence is the ability to live as one pleases without working," recited Morfad. "Quote: the art of retribution is that of concealing it beyond all suspicion. Quote: the sharpest, most subtle, most effective weapon in the cosmos is flattery."

"Huh?"

"Quote: if a thing can think it likes to think that it is God—treat it as God and it becomes your willing slave."

"Oh, no!" denied Haraka.

"Oh, *yes!*" insisted Morfad. He waved a hand toward the nearest port. "Out there are three thousand million petty gods. They are eagerly panted after, fawned upon, gazed upon with worshiping eyes. Gods are very gracious toward those who love them." He made a spitting sound that lent emphasis to what followed. "The lovers know it—and love comes cheap."

Haraka said, uneasily, "I think you're crazy."

"Quote: to rule successfully the ruled must be unconscious of it." Again the spitting sound. "Is that crazy? I don't think so. It makes sense. It works. It's working out there right now."

"But—"

"Take a look at this." He tossed

a small object into Haraka's lap.
"Recognize it?"

"Yes, it's what they call a cracker."

"Correct. To make it some Terrans plowed fields in all kinds of weather, rain, wind and sunshine, sowed wheat, reaped it with the aid of machinery other Terrans had sweated to build. They transported the wheat, stored it, milled it, enriched the flour by various processes, baked it, packaged it, shipped it all over the world. When humanoid Terrans want crackers they've got to put in man-hours to get them."

"So—?"

"When a dog wants one he sits up, waves his forepaws and admires his god. That's all. Just that."

"But, darn it, man, dogs are relatively stupid."

"So it seems," said Morfad, dryly.

"They can't really *do* anything effective."

"That depends upon what one regards as effective."

"They haven't got hands."

"And don't need them—having brains."

"Now see here," declaimed Haraka, openly irritated, "we Altairans invented and constructed ships capable of roaming the spaces between the stars. The Terrans have done the same. Terran dogs have not done it and won't do it in the next million years. When one dog has the brains and ability to get to another planet I'll eat my cap."

"You can do that right now," Morfad suggested. "We have two dogs on board."

Haraka let go a grunt of disdain. "The Terrans have given us those as a memento."

"Sure they gave them to us—at whose behest?"

"It was wholly a spontaneous gesture."

"Was it?"

"Are you suggesting that dogs put the idea into their heads?" Haraka demanded.

"I know they did," retorted Morfad, looking grim. "And we've not been given two males or two females. Oh no, sir, not on your life. On male and one female. The givers said we could breed them. Thus in due course our own worlds can become illuminated with the undying love of man's best friend."

"Nuts!" said Haraka.

Morfad gave back, "You're obsessed with the old, out-of-date idea that conquest must be preceded by aggression. Can't you understand that a wholly alien species just naturally uses wholly alien methods? Dogs employ their own tactics, not ours. It isn't within their nature or abilities to take us over with the aid of ships, guns and a great hullabaloo. It *is* within their nature and abilities to creep in upon us, their eyes shining with hero-worship. If we don't watch out, we'll be mastered by a horde of loving creepers."

"I can invent a word for your mental condition," said Haraka. "You're suffering from caniphobia."

"With good reasons."

"Imaginary ones."

"Yesterday I looked into a dogs' beauty shop. Who was doing the bathing, scenting, powdering, primping? Other dogs? Hah! Humanoid females were busy dolling 'em up. Was *that* imaginary?"

"You can call it a Terran eccentricity. It means nothing whatever. Besides, we've quite a few funny habits of our own."

"You're dead right there," Morfad agreed. "And I know one of yours. So does the entire crew."

Haraka narrowed his eyes. "You might as well name it. I am not afraid to see myself as others see me."

"All right. You've asked for it. You think a lot of Kashim. He always has your ear. You will listen to him when you'll listen to nobody else. Everything he says makes sound sense—to you."

"So you're jealous of Kashim, eh?"

"Not in the least," assured Morfad, making a disparaging gesture. "I merely despise him for the same reason that everyone else holds him in contempt. He is a professional toady. He spends most of his time fawning upon you, flattering you, pandering to your ego. He is a natural-born creeper who gives you the Terradog treatment. You like it. You bask in it. It affects you like an irresistible drug. It works—and don't tell me that it doesn't because all of us know that it *does*."

"I am not a fool. I have Kashim sized up. He does not influence me to the extent you believe."

"Three thousand million Terrans have four hundred million dogs sized up and are equally convinced that no dog has a say in anything worth a hoot."

"I don't believe it."

"Of course you don't. I had little hope that you would. Morfad is telling you these things and Morfad is either crazy or a liar. But if Kashim were to tell you while prostrate at the foot of your throne you would swallow his story hook, line and sinker. Kashim has a Terradog mind—and uses Terradog logic, see?"

"My disbelief has better basis than that."

"For instance?" Morfad invited.

"Some Terrans are telepathic. Therefore if this myth of subtle mastery by dogs were a fact, they'd know of it. Not a dog would be left alive on this world." Haraka paused, finished pointedly, "They don't know of it."

"Terran telepaths hear the minds of their own kind but not those of dogs. I hear the minds of dogs but not those of any other kind. As said before, I don't know why this should be. I know only that it *is*."

"It seems nonsensical to me."

"It would, I suppose you can't be blamed for taking that viewpoint. My position is difficult; I'm like the only one with ears in a world that is stone-deaf."

Haraka thought it over, said after a while, "Suppose I were to accept everything you've said at face value—what do you think I should do about it?"

"Refuse to take the dogs," responded Morfad, promptly.

"That's more easily said than done. Good relations with the Terrans are vitally important. How can I reject a warm-hearted gift without offending the givers?"

"All right, don't reject it. Modify it instead. Ask for two male or two female dogs. Make it plausible by quoting an Altairan law against the importation of alien animals that are capable of natural increase."

"I can't do that. It's far too late. We've already accepted the animals and expressed our gratitude for them. Besides, their ability to breed is essential part of the gift, the basic intention of the givers. They've presented us with a new species, an entire race of dogs."

"You said it!" confirmed Morfad.

"For the same reason we can't very well prevent them from breeding when we get back home," Haraka pointed out. "From now on we and the Terrans are going to do a lot of visiting. Immediately they discover that our dogs have failed to multiply they'll become generous and sentimental and dump another dozen on us. Or maybe a hundred. We'll then be worse off than we were before."

"All right, all right." Morfad shrugged with weary resignation. "If you're going to concoct a major objection to every possible solution we may as well surrender without a fight. Let's abandon ourselves to becoming yet another dog-dominated species. Requote: to rule successfully

the ruled must be unconscious of it." He gave Haraka the sour eye. "If I had my way, I'd wait until we were far out in free space and then give those two dogs the hearty heave-ho out the hatch."

Haraka grinned in the manner of one about to nail down a cockeyed tale once and for all. "And if you did that it would be proof positive beyond all argument that you're afflicted with a delusion."

Emitting a deep sigh, Morfad asked, "Why would it?"

"You'd be slinging out two prime members of the master race. Some domination, eh?" Haraka grinned again. "Listen, Morfad, according to your own story you know something never before known or suspected and you're the only one who does know it. That should make you a mighty menace to the entire species of dogs. They wouldn't let you live long enough to thwart them or even to go round advertising the truth. You'd soon be deader than a low-strata fossil." He walked to the door, held it open while he made his parting shot. "You look healthy enough to me."

Morfad shouted at the closing door, "Doesn't follow that because I can hear their thoughts they must necessarily hear mine. I doubt that they can because it's just a freakish—"

The door clicked shut. He scowled at it, walked twenty times up and down the cabin, finally resumed his chair and sat in silence while he

beat his brains around in search of a satisfactory solution.

"The sharpest, most subtle, most effective weapon in the cosmos is flattery."

Yes, he was seeking a means of coping with four-footed warriors incredibly skilled in the use of Creation's sharpest weapon. Professional fawners, creepers, worshipers, man-lovers, ego-boosters, trained to near-perfection through countless generations in an art against which there seemed no decisive defense.

How to beat off the coming attack, contain it, counter it?

"Yes, God!"

"Certainly, God!"

"Anything you say, God!"

How to protect oneself against this insidious technique, how to quarantine it or—

By the stars! that was it—*quarantine* them! On Pladamine, the useless world, the planet nobody wanted. They could breed there to their limits and meanwhile dominate the herbs and bugs. And a soothing reply would be ready for any nosy Terran tourist.

"The dogs? Oh, sure, we've still got them, lots of them. They're doing fine. Got a nice world of their very own. Place called Pladamine. If you wish to go see them, it can be arranged."

A wonderful idea. It would solve the problem while creating no hard feelings among the Terrans. It would prove useful in the future and to the end of time. Once planted on Pladamine no dog could ever

escape by its own efforts. Any tourists from Terra who brought dogs along could be persuaded to leave them in the canine heaven specially created by Altair. There the dogs would find themselves unable to boss anything higher than other dogs, and, if they didn't like it, they could lump it.

No use putting the scheme to Haraka who was obviously prejudiced. He'd save it for the authorities back home. Even if they found it hard to credit his story, they'd still take the necessary action on the principle that it is better to be sure than sorry. Yes, they'd play safe and give Pladamine to the dogs.

Standing on a cabin seat, he gazed out and down through the port. A great mob of Terrans, far below, waited to witness the coming take-off and cheer them on their way. He noticed beyond the back of the crowd a small, absurdly groomed dog dragging a Terran female at the end of a thin, light chain. Poor girl, he thought. The dog leads, she follows yet believes *she* is taking *it* some place.

Finding his color-camera, he checked its controls, walked along the corridor and into the open air lock. It would be nice to have a picture of the big send-off audience. Reaching the rim of the lock he tripped headlong over something four-legged and stubby-tailed that suddenly intruded itself between his feet. He dived outward, the camera still in his grip, and went down fast through the whistling wind

while shrill feminine screams came from among the watching crowd.

Haraka said, "The funeral has delayed us two days. We'll have to make up the time as best we can." He brooded a moment, added, "I am very sorry about Morfad. He had a brilliant mind but it was breaking up toward the end. Oh well, it's a comfort that the expedition has suffered only one fatality."

"It could have been worse, sir," responded Kashim. "It could have been you. Praise the heavens that it was not."

"Yes, it could have been me." Haraka regarded him curiously. "And would it have grieved you, Kashim?"

"Very much indeed, sir. I don't think anyone aboard would feel the loss more deeply. My respect and admiration are such that—"

He ceased as something padded

softly into the cabin, laid its head in Haraka's lap, gazed soulfully up at the captain. Kashim frowned with annoyance.

"Good boy!" approved Haraka, scratching the newcomer's ears.

"My respect and admiration," repeated Kashim in louder tones, "are such that—"

"Good boy!" said Haraka again. He gently pulled one ear, then the other, observed with pleasure the vibrating tail.

"As I was saying, sir, my respect—"

"Good boy!" Deaf to all else, Haraka slid a hand down from the ears and massaged under the jaw.

Kashim favored Good Boy with a glare of inutterable hatred. The dog rolled a brown eye sideways and looked at him without expression. From that moment Kashim's fate was sealed.

THE END



LOOK OUT! DUCK!

BY DAVID GORDON

You think maybe human beings make a capricious, demanding, unreasonable sort of cargo? Hah! There are worse cargoes! Duck eggs, for instance . . . at \$2,000 a copy and 5,000 in number.

There were four men aboard the cargo ship *Constanza* when she made the voyage to Okeefenokee. Three of them were her regular crew: Joseph Dumbrowski, the captain; Donald MacDonald, the engineer; and Peter Devris, the astrogator.

The fourth man didn't show up until the *Constanza* was almost fully loaded and ready to take off. Dumbrowski was definitely reaching the peevish stage when the panel truck came rolling up towards the loading pit that housed the interstellar vessel.

Inside the truck, the driver pointed toward the shaft of silver that speared up from the pit. "That's the *Constanza*, ahead," he said.

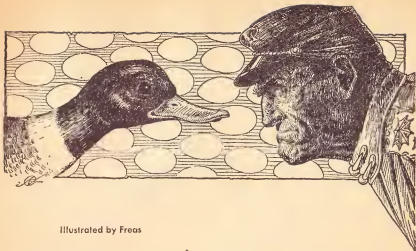
Rouen Drake, M.D., D.V.M., look-

ed at it, nodded, and looked back through the glass panel at the remaining cargo in the rear of the truck. "You can't see it, children," he said, "but your new home is just ahead. At least it will be your home for a while."

The cargo did not reply. The truck driver grinned. "You like them ducks, eh, Doc?"

The doctor grinned back. "In a way. They're the product of ten years of genetic engineering. Besides being proud of them, I think they're kind of cute."

The truck pulled up beside the ramp of the *Constanza* and braked to a halt. "Here comes Captain Dumbrowski," the driver said. Dr. Drake climbed out and offered his hand to



Illustrated by Freas

the man in the striking crimson-and-gold of the Interstellar Service. The officer took it in a bone-crushing grip.

"Dr. Drake? I'm Captain Dum-browski. Where have you been?"

The captain was a thickset man with beetling brows, and a voice like a bellowing bull.

"I got here as soon as possible, captain," Drake said stiffly. "I'm sorry if I'm late."

"We're overdue now," the captain said. "MacDonald will help you get loaded." He turned to another crimson-and-gold clad man nearby. "MacDonald, here's our last entry. One Drake and a harem of ducks." And with that, he turned and went into the ship.

Drake's jaw muscles set a little, and his face flamed crimson under his blond complexion. The truck driver smothered a snicker, and Mac-

Donald seemed to be trying to offer a friendly smile instead of an impish grin. He didn't quite succeed.

"Section Five has been set up for your . . . uh . . . ducks, Doctor," he said.

"Excellent," said Drake evenly. "Let's get them aboard as soon as possible." Then he added: "I'll check the rest of the cargo later."

Twenty minutes later, fifty ducks were safely ensconced in the specially rebuilt Section Five of the *Constanza's* hold. MacDonald leaned against a bulkhead and wiped his forehead with a handkerchief. "Hoo!" he said. "I'm worn out."

"It isn't very comfortable, is it?" Drake asked rhetorically. He, too, was streaming with perspiration, and his arms felt heavy as lead.

"Temperature, one hundred degrees Fahrenheit," MacDonald said

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in a dry voice. "Humidity, eighty-five per cent. Gravity, one point five. *why . . .* if I may ask?"

Drake stuck a soggy handkerchief in his pocket. "We have to reproduce the environment of the surface of Okefenokee as closely as possible," Drake explained. "That's what the ducks are bred for."

"What's this planet like?" MacDonald wanted to know. His eyes warily followed a duck that flapped its way through the hot, muggy air with apparent unconcern.

"Something like Earth was a few hundred million years ago. Mostly swamps and shallow seas. Plant life is pretty highly evolved—wind pollinated, though; there aren't any insects. Animals haven't gotten much above the crustacean stage. Oh, there are a few chordates, I understand, but no true vertebrates. There are some things that look like fish, but they're more closely related to the mollusks.

"That wouldn't be so bad, but it means the colonists wouldn't have the proper proteins. We've got to change the ecological setup. Therefore, the ducks."

"Why ducks?"

"Don't ask me; I'm not an ecologist."

"They're sure queer looking," MacDonald said as one of them waddled unconcernedly toward him.

"They're mutations," Drake told him. "Had to be. The surface gravity of Okefenokee is half again as great as Earth's, and the air pressure and temperature are higher—as

you've noticed. That necessitated modification of the duck's flying apparatus. And there were other changes; their diet isn't quite the same as that of ordinary Terrestrial ducks. They're still members of the *Anatidae*, but they aren't like any other duck on Earth."

The duck waddled closer and looked at the two men with apparent interest.

"What are you along for, Doc?" MacDonald asked. "Are you a veterinarian?"

"Yes. I also have an M.D. degree."

The duck looked him straight in the eye. "*Quack!*" it said distinctly.

MacDonald almost gagged.

Dr. Rouen Drake was a scholarly man who had the unfortunate luck to look like a scholar is supposed to look. He was lean and somewhat shorter than average height. His shoulders were slightly rounded, and his eyes had the faint telltale glitter which betrayed the lenses that corrected his myopia. His hair was blond and straight and had a pronounced widow's peak. Even his soft, measured, somewhat pedagogical voice betrayed him. It was the first time he had ever been aboard a spaceship in his life, and he felt somewhat out of place among the spacemen.

But he had a job to do, and he was determined to do it well.

After he and MacDonald left Section Five, they went back and checked over the other cargo. Item: One electric incubator, five thousand egg

capacity. Item: Fifty electric brooders, one hundred duckling capacity. Item: Two hundred and thirty thousand pounds duckling rations, Types A and B. Item: Three thousand pounds adult duck rations, normal feeding. Item: Three thousand pounds adult duck breeding rations.

And, Item: Five thousand crash-frozen fertile duck eggs.

All in order.

Satisfied, Drake went up to the control blister in the nose to report to Captain Dumbrowski.

He was in a somewhat better mood now, possibly because there were still ten minutes until the scheduled take-off time. If Drake had been late—

"I'm all set, captain," Drake said. "The cargo is in excellent shape, and the live ducks are all taken care of."

"Good," said Dumbrowski. He turned to the other man who had been in the control blister with him. "Lieutenant Devris, this is Dr. Drake. Doctor, this is Devris, our navigator."

Devris was a good-looking man, quiet, efficient, and intelligent. His handshake was warm and friendly.

"All right, men," Dumbrowski said, "let's get settled. Take-off in eight minutes. MacDonald, show the doctor to his cabin."

Eight minutes later, the sixty-five meter long *Constanza* lifted her huge mass gently and easily from her pit and accelerated toward the sky. As she left the atmosphere, her course changed slightly, aiming her nose at a point near Shaula in Scorpio. Then

LOOK OUT! DUCK!

the mass-time converters shifted in and the ship vanished. She was moving towards her destination at nearly ten thousand times the velocity of light. Okeefenokee was eighteen weeks away.

Time plodded on. The operation of the vessel was largely automatic, requiring only occasional human judgment. Once every twenty-four hours, the mass-time converters were cut and the ship returned to normal space so that Devris could take positional readings.

Twice a day, Dr. Drake went down to Section Five to feed and care for his ducks.

Between times, the men read, played cards, or watched the new movies that had been brought along. And each night, Captain Dumbrowski issued each man a ration of two bottles of beer.

Dumbrowski himself was a storyteller of no mean ability, although the subject matter was rather monotonous.

"And then there was that time on Tripha," he would say, pouring himself a foaming glass. "Some disease had wiped out nine-tenths of the male population. They'd whipped it finally, but even the men who were left were in pretty sad condition. Naturally"—he chuckled knowingly—"we had to do our duty. There was one little blonde who had four sisters—good lookers, all of 'em. Well, they seemed to take a shine to me, so . . ."

Or: "I remember a red-headed

dancer in Lunar City; she did a strip that was out of this world! What technique! Anyway, I was in this dive, and—"

And so on. MacDonald would try to top him, but he always came off second best. Neither of them ever repeated themselves exactly, but after a few weeks there developed an overhanging pall of similarity about the tales.

Drake noticed that Devris usually listened to Dumbrowski for a while, and then got up and strolled quietly to the astronomical dome. One evening, he walked out as usual, but as soon as he was out in the corridor, he turned and made signals with his hands and fingers.

Drake realized the signals were for him, since neither the captain nor the engineer could see Devris from where they sat.

Drake nodded imperceptibly, and got up a few minutes later. He walked quietly out, mumbling something about his ducks. Behind him, Dumbrowski was saying:

". . . Could be picked up without any trouble. So I . . ."

Drake headed for the astronomy dome. Devris was pouring a colorless liquid into a couple of glasses. He added ice and fruit juice and said: "I thought you might like to get away from Joe 'One-Note' Dumbrowski for a while. Here; have a drink." He handed one of the glasses to the doctor.

Drake sipped at the drink. It was smooth, but with a strange aura of

power. "Isn't this against regulations?" he asked.

"Not exactly." Devris' smile was that of the triumphant loophole-seeker. "'Articles of Interstellar Commerce,' . . . he quoted, "'Section VIII, Paragraph 4: No beverage alcohol shall be permitted aboard Service vessels except regulation five per cent beer, which shall be rationed to personnel at the rate of twenty-four fluid ounces per day, such rations not to be cumulative.'" He paused for a moment, then went on: "'Section IX, Paragraph 3: Intoxication of personnel shall be punished by the commanding officer of the ship according to Section II, Paragraphs 7 and 8, dealing with endangering the lives and/or property aboard service vessels.'" "

"Then what's this?" Drake asked, holding up his glass.

"Lens cleaning fluid," Devris said candidly. "I find absolute alcohol to be an excellent lens cleaner.

"Naturally," he continued virtuously, "no one in their right mind could consider lens cleaning fluid a beverage."

"Which proves," said Drake, taking another sip, "that I am not in my right mind."

"I'll drink to that," said Devris. They drank.

"Very neat," Drake said. "As long as you do not become intoxicated and do not have alcoholic beverages aboard, you are not disobeying the regulations. Does the captain know about this?"

"Probably. But we don't mention

it. We have a tacit agreement. He doesn't check on my lens cleaner, and I don't ask him why he has an extra foot locker aboard."

"I see. No one checks on the captain. What about MacDonald?"

"He's satisfied with his beer ration, I guess. He isn't much of a drinker. He'd rather swap true confessions with Joe One-Note." He finished his drink and mixed another. "You know," he said philosophically, "I have done a little computation. Assuming that all of Joe's stories are true, and assuming that each of his conquests were completed in a minimum amount of time, and using Service tables to compute the average length of a voyage and the average time of stay on a planet—figuring all these in, I say, I have come up with a cubic equation."

Drake nodded. "I follow you. So?"

"I have come up with two real and one imaginary roots to the equation." He held up a hand and began counting them off on his fingers.

"Real Root One: Captain Dumbrowski is over nine hundred years old. Otherwise, he couldn't possibly have done all that work in the time allowed.

"Real Root Two: Captain Dumbrowski has psionic powers and is able to teleport himself from this ship every night to some suitable planet in the galaxy and get back within eight hours."

"Uh-huh. And the imaginary root?"

"Captain Dumbrowski's stories
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are imaginary. But, being imaginary, such a root is not allowable in a real situation."

"Naturally not," agreed Drake. "Pour me another drink."

As the navigator mixed, Drake asked: "I wonder why he lays it on so thick?"

"He married young," Devris said oratorically. "His wife is a small, birdlike woman to whom he is intensely devoted. She is, as far as I can determine, a simpering prude."

"So he tells sea stories like Long John Silver, eh?"

From then on, Drake managed to get away from Dumbrowski early and have a chat with Devris in the evening. The navigator proudly displayed his instruments, and even let the doctor compute their position one day. Drake got one of the factors confused, and Devris respectfully informed him that he had better tell the captain to turn around, because the ship was heading towards Alhena in Gemini, dead away from their target.

Drake, in turn, took the navigator to Section Five to show him his ducks.

"Why live ducks, anyway?" Devris asked. "Why not just ship them all as eggs?"

"Well, remember, these aren't going to be domestic ducks; they'll be allowed to go wild on Okefenokee. One of the most important things a duck can learn is how to be a duck. It isn't all instinct, you know. So we have a live adult duck for every hun-

dred eggs. The old duck teaches the younger ones the duck business."

"Been in the family for generations, eh?" Devris asked.

"We hope so. Believe me, we hope so."

"You hope so? I'd think any duck could learn the duck profession. It ought to be easy as duck soup."

Drake winced. "Not necessarily. These ducks, like most domestic ducks, are descended from the *Anas boschas*—the mallard. But domestic ducks have been inbred and crossbred for meat and egg qualities. In several strains, the brooding or nest-sitting instinct has been bred right out. Such a species wouldn't survive in the wild; the duck would lay her eggs and then walk off and leave them.

"We went back to the original wild mallard to get *Anas okeefe-nokeias*, here. The genetic engineers worked hard to get the bird they wanted, but a couple of strains turned out to be absolutely worthless. One strain was a failure because the opposite sexes refused to have anything to do with each other—no mating instinct."

"Tell that to Captain Dumbrowski. He'll have a duck fit," said Devris calmly. He ducked just in time.

Seventeen weeks slipped by. It was on the fourth day of the eighteenth week, two days flight from Okeefe-nokee, that Drake found a sick duck.

It wasn't really very ill; it had managed to get a scratch near one eye, and the scratch had become slightly infected. It took him a cou-

ple of minutes to snare the duck, then he picked it up and looked at it.

"Not too bad at all," he said. "I'll take it up to my cabin and put something on that. And I guess I'd better take a good look at the others; they may have been fighting."

Devris mopped the perspiration from his dripping brow. "You want me to take it up, doc? I have to go make my positional check, anyway. MacDonald is going to stop the ship in a few minutes."

"Sure. Thanks." Drake handed the duck to the navigator. "Keep her close to your body, and when you get her up to my place, put a blanket around her. These ducks have a higher body temperature than normal, and that air out there is pretty cold to them."

"Can do," said Devris. And he left, with the duck cradled securely in his arm.

Fifteen minutes later, a loud-speaker blared in the room. The dense air, coupled with Dumbrowski's booming voice, made a thunderous noise in the compartment. Squawking, flapping ducks fled from the voice.

"DRAKE! GET UP HERE TO THE CONTROL BLISTER! AND I MEAN FAST!"

Drake made it fast. There must be something badly wrong for Dumbrowski to give an order like that.

The first thing that struck him oddly when he entered the control blister was the peculiar odor. There was the acrid smell of burnt insulation, the biting, metallic effluvium of vaporized copper, the stench of burnt feathers,

ASTOUNDING SCIENCE FICTION

and—beneath it all—the tasty, tantalizing aroma of roast duck.

Devris was standing at rigid attention in the middle of the room, listening to Dumbrowski bellow.

"... And I don't give a damn what the doctor asked you to do!"

"He didn't ask me, captain; I volunteered."

"Shaddup! You had no right to volunteer! He—"

"What about me, captain?" Drake asked.

Dumbrowski whirled. "Oh, *there* you are! What do you mean, letting one of your blasted ducks out of their Section? You dumb cluck, do you realize you've wrecked a multi-million dollar spaceship?"

MacDonald was kneeling over an open panel from which heavy clouds of smoke were still pouring.

It seemed that MacDonald had been inspecting the circuits, giving them a final check before the last two days of drive. The mass-time converters had been shut off so that Devris could make the daily position check.

MacDonald had had the panel open, and had stepped across the room to get a meter of some kind.

And a duck had walked in.

MacDonald had tried to shoo it out, but the duck, stubborn to the end, had shooed in the opposite direction. Instead of fleeing through the open door, she had headed for the darkened cabinet which housed the control circuits.

She had landed across a couple of leads which came directly from a

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high-voltage, high-amperage, direct-current generator. MacDonald had been afraid to try to get her out, and afraid not to. She had flapped and quacked and fluttered about, jiggling loose wires and cracking other equipment. Then the insulation on the DC leads had broken, and all hell busted loose.

The unfortunate thing was that the leads had been between the generator and the circuit breakers. There was no load on them at that point and no reason to think there would be a short. But short there was.

The duck had died instantly, and had carbonized an instant later. The arc established had blazed its way back to the generator, destroying everything in its path. Carried by the ionized metal between the leads, the arc had not stopped until it reached the point where the leads were separated by a high-test ceramic insulator.

"And the worst of it," MacDonald said, "is that we can't replace it. We're not equipped to repair a burned out generator and all that other stuff. We don't carry that many spares. Things like this just don't happen on board a spaceship."

"I'll say they don't!" Dumbrowski bellowed. "And if it hadn't been for this duck doctor here, it wouldn't have happened at all!"

Drake clenched his teeth and said nothing.

"Do you know what this means?" Dumbrowski asked in a subdued roar. "It means we will have to call all the way back to Earth and tell them we're

marooned here, two days' time from our destination. And that means we'll have to sit here and wait for eighteen weeks for the ship to get here with the necessary parts!"

"Couldn't we get a ship here from Okefenokee?" Drake asked, forcing his voice to keep calm.

Dumbrowski sneered. "Hardly. That's a Class C colony; it isn't really a colony yet. It isn't self-supporting. There isn't a ship any closer than Earth."

He stood there for a moment, and evidently his anger subsided a little. "All right; it's happened. We'll have to make the best of it. We've got enough food on board, and the paragravity units didn't go—thank Heaven."

MacDonald, rummaging around in the smouldering mass of fused equipment, said: "The only thing gone is the control system of the mass-time converters and the drive thrust." He scabbled around a bit more, then: "And all the leads to the cryogenics section."

It took a full two seconds for that to hit Drake. "You mean the refrigerator? The one my eggs are in?"

"Yeah," said MacDonald, his voice muffled by the cabinet.

"Five thousand rotten eggs on our hands!" bellowed Dumbrowski. He turned to Drake. "We might as well start dumping them now."

It was all Drake could do to hold his temper. Part of him wanted to throw a punch straight into Dumbrowski's teeth; part of him whispered that it might not be too

sensible. Dumbrowski outmassed him by fifteen kilos.

Discretion won by a narrow margin. "I'm afraid I can't let you do that, captain," he said stiffly. At least not until we check with the Interstellar Commission. They might frown on our dumping those eggs without doing everything in our power to save them."

"Look, Doc," Dumbrowski said coldly, "I've dumped cargo before if it was going to spoil. I once dumped five tons of powdered eggs because a leaky water pipe damped them down. When eggs begin to stink, they really stink. Hydrogen sulfide isn't too congenial an aroma.

"If I ask the Commission, they'll just tell me to dump 'em. So why bother?"

"Now *you* look, Dumbrowski." Drake's voice was rapidly becoming brittle. "In the first place, those aren't ordinary eggs. They are fertile, mutant duck eggs. In the second place, I am quite sure that the Commission won't tell you to dump five thousand eggs worth two thousand dollars each!"

Dumbrowski's heavy brows shot up. "Two thou— You mean those eggs are worth *ten million dollars*?"

"Exactly."

"But what else can we do? MacDonald!" He swung around to the engineer, who was still probing in the ruins. "Is there any chance we can get the refrigerator going again?"

"None, skipper. Everything in here is gone."

Dumbrowski turned back to Drake. "See? What else can we do?"

"What do you normally do with fertile eggs?"

"You mean—?"

"I mean we incubate them. Check with the Commission." And Drake turned on his heel and walked out.

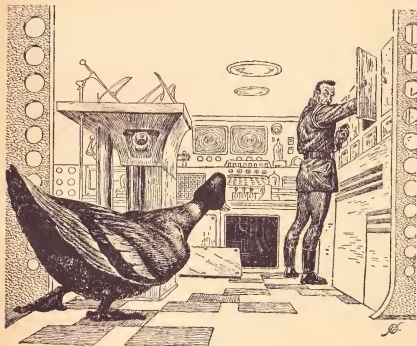
Drake blamed himself for the escape of the duck. He'd forgotten to tell Devris that they were stronger than an average duck because of the high gravity they lived under. Devris had wrapped the duck securely in a blanket and left it on Drake's bed. The door to the doctor's cabin had

been left open a crack, and after the duck had wriggled herself loose from the blanket, she had gone out for a stroll.

Well, he had to agree with Dumbrowski on one thing: there was nothing to be done about it now; they'd just have to make the best of it.

He went down to Section Twenty, where the refrigerators were. The egg cases would have to be removed and thawed properly, at just the right rate. Then they'd have to go into the incubator. He figuratively spat on his hands and got to work.

When Lieutenant Devris came



down an hour or so later, the eggs were in the slow warmer. Drake looked up as the sound of boots echoed along the corridor and into the room.

"Hi, Pete. What's up?"

Devris grinned lopsidedly. "The captain told me to bring this to you. He's too furious to bring it himself." He handed Drake a flimsy.

Drake looked at it and grinned. It read: "Okeefenokee duck eggs must not be allowed to perish. Incubate and hatch. Every effort short of actual danger to crew must be expended to save ducks. Crew of the *Constanza* is instructed to give Dr. Rouen Drake full co-operation."

Devris said: "I'm sorry about that duck, Doc."

"Forget it. It could have happened to anyone. What are the chances that it would walk into the control blister? Pretty small, I'd think."

"Yeah. Pretty small. But it happened."

"I'll say it did. What a mess." He paused and looked up at the navigator. "Pete?"

"Yeah?"

"Pete, why does Dumbrowski have it in for me?"

Devris looked uncomfortable. "I don't know, Doc. It's just his way. He yells at everybody. Don't ask me why he picked you to rib. You can't always explain the queer quirks in a guy's mind." Then he turned and went out.

Drake looked at the door for a long time. Then he shrugged and went on with his work.

The eggs went into the big automatic incubator. Normal duck eggs are incubated at 101° to 103° Fahrenheit for twenty-eight days, but the Okeefenokee duck eggs required 129° F. for only twenty-one days.

Every ten hours, the incubator automatically turned the eggs; the atmosphere inside was kept properly humid and warm. On the sixth day, Drake candled the eggs to see if any were infertile. Thirty-two of them showed no sign of life; they went into the disposal unit. The others went on incubating.

Dumbrowski calmed down quite a bit during the next couple of weeks. Drake didn't go out of his way to avoid the man, but he didn't seek the captain out, either. The feeling seemed mutual.

Still, Drake dreaded the day when he would have to tell Dumbrowski the whole truth. He had spent his time getting the exact measurements of the ship—and the ship wasn't quite big enough.

Eighteen weeks until help would come from Earth. Eighteen weeks of floating in emptiness, fifty-four light-years from their destination, thirty-four hundred light-years from Earth, and nine light-years from the nearest star.

The eighteen weeks became seventeen, then sixteen, and then fifteen. And the duck eggs were ready to hatch.

Two days before the hatch was ready, Drake went to Captain Dumbrowski. For over a week, things had looked calm on the surface, but un-

derneath, the situation was about as touchy as dry nitrogen iodide in a sandstorm.

Dumbrowski was playing cribbage with MacDonald. "Fifteen-two, fifteen-four, pair six, pair eight," he said, pegging his hand. He looked up as Drake entered. "Hello, Doc. How're the eggs?" His voice was carefully modulated.

"They hatch day after tomorrow, captain. I'll need some room for the brooders. They're all knocked down for shipment, and I'll have to put them together."

"I see." Dumbrowski shuffled the cards slowly. "About how much room will you need?"

"There's fifty of 'em," Drake said. "They're square, two meters on a side."

"I see." He tamped the cards on the table, cut the deck, and shuffled again—slowly. "That's two hundred square meters of floor space."

"A little more," Drake said. "They can't be crowded together too much."

Dumbrowski sighed gustily. "Well, I reckon we can find space here and there in different sections. It'll take a little moving around, but I guess it can be done."

"I'm afraid that won't do, captain. You see, those ducks have to be raised under one point five gees, at high pressure and high temperature and high humidity—just like the rest of the ducks."

Dumbrowski stopped shuffling. "I see," he said at last. "They're going to hatch in two days and we have to

shift the cargo around so that you can have another section. Then we have to reset the paragravity units under the floor. And set up the heaters and the humidifiers and the pressurizers. I see." He put the cards down carefully on the table and looked up at Drake. "All right, Doc. MacDonald and I will tend to it. Meanwhile, I'd appreciate it if you'd stay out of my sight for a while."

Drake swallowed and said nothing for a moment. Then: "You hate my guts, don't you, Dumbrowski?"

"I would if you had any," the captain said evenly. "You get 'em; I'll hate 'em."

That evening, Drake went up to the navigation dome. Devris was punching figures into a small computer, so the doctor sat down and waited quietly until he was through.

After several minutes, a relay clicked, a typer rattled a little, and a white sheet covered with figures slid out. Devris took it, stared at it, and snarled four words.

"Is that what's known as a 'deep space oath'?" Drake asked mildly.

"Hoh? Oh, hello, Doc. Didn't see you come in." He looked back at the paper. "If you mean an oath directed towards space, yes. So far, I can't pin our exact position down without an error of plus or minus one light-month. That's a little over four minutes flight time."

"That sounds pretty good."

"Oh, it is; but I want it better. My ambition is to be able to get it down plus or minus an inch, but I think

the noise level is a bit too high."

"Hm-m-m. Where's Dumbrowski and MacDonald?"

Devris looked up from his paper. "Didn't you know? They're working on Section Six."

"Oh?" Drake blinked. "I'd have thought they'd have that cleared out hours ago."

Devris let his mouth hang open for a second, then snapped it shut. "Oh, joy, joy. What you know about a spaceship could be printed in news-fac headline print on half-inch osmium plate and it would consist entirely of the fifteenth letter of the alphabet."

"What do you mean?"

"I mean that the paragravity units under the floor have to be completely reblocked. You don't just wave your hand to get an extra half gee out of 'em."

Drake swallowed—hard. "Why . . . why, I thought all you had to do was turn a dial or something, like a thermostat."

"You did? Is that why you waited until two days before the hatching to tell Dumbrowski? He'll be up all night and all day tomorrow, he and MacDonald. I'd be down there helping them, except there isn't room between the deck plates for three men."

Drake buried his face in his hands. "This is horrible! No. Nononono!"

Devris looked a little alarmed. "Oh, now, Doc, it isn't as bad as all that. You didn't know."

The doctor looked up. "It's worse than that! I need that little bitty space for ducklings—*ducklings*, mind

you! But do you realize that those birds will be adult ducks by the time the rescue ship gets here? An adult duck needs eight thousand square centimeters of space; those ducks will need four thousand square meters of floor area by the time they grow up!"

"Four thousand square meters," Devris said in a thoughtful tone. "That's pretty nearly the whole deck area of the ship. Interesting." He got up and went over to the bottle marked: "Lens Cleaner" and began mixing a stiff drink.

He was humming to himself, and it took Drake a second or two to recognize the tune.

*I heard one day
A gentleman say
That criminals who
Are cut in two
Can hardly feel
The fatal steel
And so are slain
Without much pain.
If this is true,
It's jolly for you;
Your courage screw
To bid us adieu—*

Devris stirred the drink vigorously and handed it to the doctor. "You'd better go down and tell Dumbrowski now, before he gets too much more done on that section. Drink that—you'll need it."

Drake finished the glass in short order and headed for Section Six.

The stairway to Section Six was closed, and a big sign glowed on its surface.

DANGER! THE P-G UNIT IN
ASTOUNDING SCIENCE FICTION

THIS SECTION IS OFF! USE EXTREME CAUTION!

Drake opened the door carefully and peered down the stairway. The lights were on, and everything looked normal. He started down the stairs.

Halfway down, something tugged at his insides and sudden nausea hit him. He stumbled down two more steps, and the ship seemed to do a prodigious loop. There seemed to be a pull from above. He was falling *up* the stairs! He lurched out and grabbed at the railing. He missed, and the ship whirled about him. He did a queer somersault, while his stomach flipped in the opposite direction. He twisted frantically, trying to regain his balance and his sense of orientation. His stomach flipped back in place, twisted around, joggled, gave up in despair, and emptied itself of its contents in one titanic upheaval.

Drake passed out, colder than a fritter.

He was being shaken. A voice was saying: "Come on, Doc; snap out of it. You're all right, Doc; come on."

In the background, he could hear Dumbrowski's bellowing laughter.

As if in a dream, he opened his eyes blearily. "What happened?" Then: "Where am I?"

"You're in Section Seven, Doc," said MacDonald. "You stepped across the barrier field into no-gee, and went haywire."

"Boy!" said Dumbrowski, "did

you look funny!" And again he burst into laughter.

Drake found himself lying on the floor. His clothes were a mess, and his head still felt dizzy.

"But I've stepped across barrier fields hundreds of times," he protested feebly. "It never did that before."

"Sure," MacDonald said. "You've gone from one and a half gees to one gee and vice versa. But all you felt was a weight shift. But total absence of pull is the limit; you lose all your orientation."

"You flipped, man; you *really* flipped!" Dumbrowski had subsided to a rumbling chuckle, punctuated by gasps.

"How do you feel?" asked MacDonald with a broad grin.

"I feel fine." Drake's voice was cold. He sat up, pulled a handkerchief from his pocket and began dabbing at his face. His stomach still felt a little queasy, but otherwise he was all right.

"Didn't you know the Olympics were being held in Madagascar this year?" Dumbrowski asked. "Or did you have some other purpose than trying to win the fancy-diving championship?"

"I came down to tell you something." The ice in the words almost liquefied the air, but Dumbrowski didn't seem to notice.

"Really? Well, I must say you attracted my attention. What was it?"

Drake told him. He told him in detail and with precision. And, inside himself, he enjoyed every sec-

ond of watching Dumbrowski's expression change. *Laugh at me, will you? Laugh now. Go ahead and laugh.*

Dumbrowski didn't laugh. His face darkened a little, and he said: "You don't think very far ahead, do you, *Doctor?* You're supposed to take care of those ducks, not me. You wanted 'em hatched; my orders are to co-operate. Well, you haven't told me a thing. I don't know what kind of orders you think you're giving, but I've had just about enough of 'em. I'm tired of walking around blind on my own ship, wondering when you're going to come up with another half-baked idea."

It had the effect of an emotional thermite bomb. In a phenomenal energy gain, Drake's nerves went from frigid to boiling. "Now, listen here, you thickheaded ape . . . you . . . you dumb lowbrowski! You haven't even offered to co-operate! You haven't even asked any questions! How am I supposed to know everything when you don't tell me and don't ask me?"

"*Me?*" bellowed the captain. "*Me?* How am I supposed to know what kind of questions to ask about ducks? Who ever heard of raising ducks on a spaceship, anyway? You and your eggs, you egghead! You and your filthy rotten eggs!"

They were on their feet now, glaring at each other. MacDonald was looking from one to the other apprehensively, wondering what was going to happen and when.

"My eggs are cleaner than your

filthy stories!" Drake snarled. "At least I don't bore everybody to death with imaginary tales."

That was enough for Dumbrowski. He snarled back at Drake, then, with a bellow of mingled rage and pain, he came at him.

He was heavier than Drake, but they were more evenly matched than might be supposed. The doctor had been working with his ducks in a one-point-five gee field for several years, at least an hour a day. His muscles were harder and tougher than they looked.

Drake stepped aside, and the captain's blow missed. But his other arm, flailing out, caught Drake in the ribs. The doctor grunted and drove a fist into Dumbrowski's abdomen at short range. The spaceman's hard-muscled middle gave a little, and his arms went around Drake. They went down together, rolling over and over on the tough plastic covering that sheathed the steel deck.

MacDonald ran forward to break up the battle, but one of the combatants swung out a leg at just the wrong moment and caught the engineer across the shin. He staggered back, off balance, and dropped, landing hard. He got up and limped toward the intercom while the Battle of Section Seven went on.

He jabbed the general call button and bawled: "Pete! Come down to Seven! These two blockheads are tryna kill each other! On the double!"

Devris barreled down the stairway

and tried to help MacDonald break up the tussle—without noticeable success. Both of them got punches for their pains.

Finally, Devris ran over to the wall and pulled out the emergency fire hose. He almost turned it on before MacDonald yelled: "Hey! Pete! Water—not carbon tet!"

Devris looked at the selector dial. It pointed at CCl_4 . He twisted it past CO_2 to H_2O and flipped the switch. A high-velocity stream of water splattered into the tangled bodies on the floor.

They broke up, spluttering.

"Now both of you stop," Devris commanded, "or I *will* use the carbon tet!"

But it wasn't needed; the water had done the job.

"How's your nose?" Devris asked.

Drake stood before the mirror in his room and surveyed himself. One eye was bruised a little and his nose was badly swollen. "Id hurds," he said, "bud I thig ids gwid bleedig. I'll dage the pagging oud." He pulled the packing from his nostrils and reached into his kit for a little spray gun. He directed the cloud of mist into his nostrils for a second.

"There; that's better."

MacDonald stuck his head in the door. "You all right, doc? Anything broken?"

"I'm O.K.," Drake told him. "For a while I thought I'd busted a hand on Dumbrowski's head, but I took a look at it under the transparency, and it's only bruised."

LOOK OUT! DUCK!

"Well . . . uh . . . You *sure* you feel O.K.?" MacDonald's tone was hesitant. "Uh . . . the . . . uh . . . the captain has a pretty bad eye. I wonder if you'd take a look at it."

Drake hesitated. "I doubt if he'd let me in the room."

MacDonald grinned and relaxed a little. "He said that if you didn't come, I was to tell you that *you* caused the damage and you had better get up there and fix it or the skipper will confiscate your med kit, report you to the TMA, and personally come down here and beat you in a fair fight." He shrugged. "I'm quoting, you understand."

In spite of the fact that it hurt his lip, Drake grinned. "I'll be right up. And you tell him that if he gives me any trouble I have a hypo here that will put him to sleep for a week."

"Righto!" MacDonald vanished.

As the doctor packed his kit, Devris said: "I see you've learned one thing about Dumbrowski."

"Yeah? What's that?"

"That he doesn't expect anybody to believe what he says when he exaggerates."

Drake paused to let that sink in. "You mean—"

"Yeah. Those stories of his. They bore me, but he and MacDonald have a lot of fun with them. Everybody doesn't have the same tastes, Doc."

Drake closed his kit slowly. "You're right; they don't." He picked up his kit and headed toward the captain's room, wondering what he was going to say.



When he went in, Dumbrowski was sitting in a chair with his shirt off, scratching his hairy chest. His face was a mess. He'd obviously washed it once, but there was still blood pouring from a cut under his eye. With his free hand—the one that wasn't scratching—he was holding a gauze pad to the cut, but it had already become bloodsoaked.

The two men looked at each other without smiling.

"You hurt?" Dumbrowski asked levelly.

"Yeah," Drake pointed at his nose. "Slightly busted," he lied. "You?"

Dumbrowski removed the pad, and blood poured from an inch-long cut directly over his cheekbone. "I'm bleedin' to death, you butcher."

Drake walked over and looked at the wound. "I'll put a tourniquet around your neck."

"You would."

Drake took antiseptics and healing agents from his bag and did things with them. Dumbrowski sat stolidly through it all. Finally, the doctor sprayed dermaseal over the cut and pinched it together while the proteinoid plastic polymerized, sealing the edges of the wound.

The eye was badly swollen and purpling. Drake took a hypogun out of his case and fired three minuscule shots into the tissue around the eye and then stood back.

"You'll live," he said.

"Thanks, Doc." He turned to MacDonald. "Mac go down and get Pete, and you two put that Section Six peegee unit back together. We'll have to work on the main generator coils instead."

When MacDonald had gone, Dumbrowski got up and walked over to his foot locker, from which he extracted a one-liter bottle of amber fluid. "I hope you like Irish," he said. "It's as good for settling a brawl as it is for starting one." He poured two and added ice water. Then he said: "We've got to figure out how we're going to handle these ducks."

He never mentioned the fight again.

"I really don't think I can stand this much longer," Devris said. "I've gone along this far just for the gag, but I have almost reached my limit."

The heat was oppressive. The air was so wet that it seemed to splash as they slogged through it. And at

one and a half gravities, even the effort to lift a foot was annoying and tiring.

Drake took a scoopful of duckling food from a fifty-kilo drum and dumped it into the feeding troughs near the brooder.

"*Wakwakwak!*" chortled a hundred little balls of feathers as they scrambled around the heating unit of the brooder.

Devris poured water into the drinking pans. It ran abnormally fast and splashed queerly under the extra pseudogravitational acceleration. "Yes, sir," he repeated, "just about reached my limit."

"What are you griping about?" Drake asked.

"Oh, nothing, nothing. It's just that for the past two weeks, I have been bumbling around under a gee pull that makes me feel like I was made of lead. I seem to have spent all my life feeding ducklings stuff that acts like bird shot and pouring them drinks that flow like mercury."

"There's not *that* much difference," Drake objected.

"In addition," the navigator went on, ignoring the interruption, "I have to lug this grossly heavy corpse of mine around through a fever-swamp atmosphere that is gradually driving me to the verge of acute claustrophobia." He wiped at his forehead. "And, as I said, I have just about reached my limit."

"What are you going to do when you reach it?"

"Take a taxi and go home," Devris said, with an air of finality.

Drake finished filling the feeder and dusted off his hands. "That's the last one for today," he said. "Let's go up to your place; I want to look up something in that book of regulations of yours."

Devris set down his bucket of water. "How did you know I had a reg book?"

"Simple deduction."

"He can't even use a word without 'duck' in it," Devris whispered in a hoarse aside. "O.K. How?"

"I reasoned that no one would be able to quote from regulations the way you do without having studied them extensively. Whence, it follows that you must own a copy of your own, since it would be inconvenient for you to borrow the captain's all the time—and bad politics, besides."

"Marvelous, Holmes! Absolutely marvelous! You figured it out with only those few clues?"

"Almost," Drake admitted modestly. "Of course, there was one additional bit of evidence."

"Which was?"

"I saw the book in your room."

"Holmes, you are phenomenal; let's go."

The two men plodded their way up the stairs. The entire ship was under one hundred and fifty per cent of a Standard Gee now; the power coils had had to be rebuilt, but it was easier than redoing each floor singly.

They finally pushed their way into Devris' cabin and sat down.

"Whooo!" Devris said. "At least it's cooler in here."

MacDonald had rigged up individual air-conditioners for the sleeping rooms, but nothing could be done about increased pressure and gravity. The air was cooler and less humid, that was all.

Drake took the copy of the Interstellar Commission Regulations and began leafing through it.

"What's the trouble?" the navigator asked.

"Space," Drake said. "We haven't got enough floor area on the ship to take care of the ducks unless we jettison some of the cargo. This is a pretty big ship, but it's not big enough."

"Cargo?" Devris put a finger to his chin and stared at the ceiling. "You want to get rid of non-perishable cargo. Hm-m-m." He rubbed his chin with the finger. "Try Section XIX, Paragraph . . . uh . . . seven, I think."

Drake turned to that section and began reading.

"The cargo officer shall be responsible for all damage to the ship due to shifting cargo, since it shall—"

"Nopce," Devris interrupted, "that's for bigger ships, with four or five men in the crew. Wrong paragraph. Try Seventeen."

Drake flipped over several pages. "If, in case of emergency, it shall become necessary to jettison cargo, such cargo shall be that which is the least—"

"I can boil that down for you," Devris said. "There are orders of precedence. The idea is to junk the cheapest, most useless cargo first, and

work your way up. Suppose you have a hundred kilos of oxygen and a hundred kilos of diamonds, and you have to get rid of a hundred kilos of something. Which do you get rid of?"

"Well, if it's space you need, you get rid of the oxy, because a hundred kilos of diamonds can be broken up and stashed here and there in out-of-the-way places. Even if they couldn't, they'd be kept because they're a little bit more expensive than oxy.

"On the other hand, if the ship is low on oxy, you jettison the diamonds. See?"

"Who decides which to drop?" Drake asked.

"The captain, always—even if there's a cargo officer aboard. It's the captain's decision, because his job is to protect life first and property afterwards."

Drake nodded. "That's what I wanted; I'm going up to see Dumbrowski."

As he was toiling his way up the stairs, he met Dumbrowski toiling his way down.

"Oh, there you are," the captain said. "I wanted to know if you needed that incubator any more."

"Just what I was going to talk to you about. I was looking things up in the regulations, and I found we can toss out a lot of stuff—a lot of the cheaper cargo."

Dumbrowski nodded slowly. "You looked it up, eh? That's good. But, you know, I hate to throw anything

away—and I don't think I will."

"But, captain—"

"Will you kindly go back down those stairs? I'm getting tired of just standing here. Let's go to Devris' room."

Drake retreated obediently. They went to the navigator's compartment, and Dumbrowski knocked resoundingly on the door. "Pete! It's me."

"Come on in, skipper," Devris said.

Dumbrowski looked at the doctor. "I wouldn't want to open the door while he was cleaning lenses," he said. "It might get dust on them if I opened the door too suddenly."

"I see," said Drake.

They pushed the door open and sat down.

"Now, about this jettisoning cargo," Dumbrowski began. "I don't think it's necessary. Besides, we just couldn't dump all the stuff we'll need. We couldn't get rid of all your duck food, could we?"

"No-o-o; we couldn't."

"But we'll need that space. So, I have an idea. Look; we're a good long way from the nearest large gravitational body. Is that right, Pete?"

"I haven't detected anything in the past five weeks. We're nine light-years from the nearest star. It's a blue-white; you can't miss it if you look out the ports."

Dumbrowski nodded and looked back at Drake. "So here's what we do: We take all the stuff we can and cart it outside and attach it to the hull with magnaclamps. That in-

cludes all those drums of duck food, and everything else. The brooders, too, when you're through with 'em.

"Then, if we need anything, all we have to do is go out and get it. Follow?"

Devris just nodded, but Drake felt rather dazed. It had never occurred to him that it was possible to throw something overboard without throwing it away.

I'm just not used to thinking in terms like that, he thought. *I keep thinking of aircraft.* Then he thought of something else. "What do we do when the rescue ship comes?"

"Well, they'll be able to take part of the cargo, and we'll haul back in the rest. Those ducks can be crowded for a couple of days, can't they?"

"Sure; two days won't matter." After all, he decided, it wouldn't really crowd them much. By that time, all the feed would be gone—or at least most of it would.

"Good," said Dumbrowski. "Good. There's one other problem. Who's going to clean up after the ducks?"

Drake smiled a sickly smile. "I guess we'll all have to work at it. It'll all have to be carted to the disposal."

"Three cheers." Dumbrowski stood up. "Well, MacDonald and I will start hauling stuff outside." And with that, he heaved himself up and walked out.

"You know," Drake said, looking at the closed door, "that guy worries me. For the past couple of weeks, I

thought that . . . well—" He stood up and looked at his hands, frowning. "I thought we'd arrived at an understanding." He looked up at Devris. "But he still seems worried about something."

"Well, sure he is," Devris said. "He's not going to be in the best of odor with the Commission."

"Why not?"

"You mean you don't know?"

Devris sat down again on a nearby chair. "Why, man, he's in trouble. So am I, and so is MacDonald—although neither of us is in as bad a jam as the skipper is."

"Why?"

"Because the ship has been disabled. We don't have any reasonable explanation for it. I'm in a jam because he had the control panels open when the duck walked in. But Dumbrowski is in a jam because he's captain, and all this is his fault. He's directly responsible for the whole thing."

Devris wasn't looking at Drake now; he was looking at his fingernails. "Maybe you wondered," he said, "why the skipper was so sore at you after the accident. Maybe I should have told you before this, but here it is."

"The *Constanza* is Dumbrowski's whole life. Sure, his little wife is a nice gal, but she's not something you can anchor your life to. Dumbrowski's pinned his life to *Constanza*."

Drake chewed at his lower lip. "I can see that. Sure. But what did I do?"

Devris looked up from his fingernails. "It isn't something you did. It's something you can't be held responsible for.

"The ship has been wrecked. For the first time in his career, Dumbrowski has had to call for help because his ship was out of commission. *His* ship. The *Constanza*.

"I'm responsible because I brought the duck up. And Mac, as I said, is responsible because he shouldn't have let the duck get in. But Dumbrowski may never get another promotion—it's his ship that was wrecked."

"I see," Drake said slowly. "And I'm not responsible at all?"

"Not as far as the Commission is concerned. It couldn't be shifted on to you, even if you wanted it to be." Devris smiled a little. "And I know you well enough after all these weeks to know that you'd take responsibility if you could. But it won't wash. It can't be done. We've *had* it—that's all."

Heat. Damp, soggy, broiling heat. Unpleasant, miserable heat, from which there was no escape. And a great burden of weight that sapped the strength rapidly in the hot, wet air.

MacDonald lifted another shovel and dumped it into the wheelbarrow. He was stripped to the waist, clad only in a pair of sport shorts and his boots, and the perspiration ran down his neck and chest and back, soaked into the shorts, ran on down his legs, and

collected in soggy pools in his boots. His hands were slippery on the handle of the improvised shovel, making it difficult to work.

Across the room, Drake was surrounded by hundreds of awkward little birds who chorused their monotonous *wakwakwak*.

MacDonald stopped shoveling for a moment and said: "I'm glad I'm not the feed man around here; I'm perfectly happy to handle the other end of the operation."

"I don't follow you," said Drake.

"No, but the ducks follow you," the engineer pointed out. "It would drive me nuts to have them underfoot all the time."

Drake put more feed in the pans. "You mean you think they follow me around just because I feed 'em?"

"Well, don't they? You give 'em their goodies; I just clean up after 'em."

"It isn't that," Drake said. "Even if *you* fed them, they'd still follow me, I'm the first moving thing they saw after they hatched. It's a built-in reflex. They think I'm their mother."

MacDonald plied his shovel again. "In that case, I am gladder than ever. Imagine being mama to thousands of ducks." He lifted the scoop and dumped it into the wheelbarrow. "Imagine. Thousands and thousands of ducks. Following you. Loving you. 'Mama! I stubbed my little webby foot, Mama. Kiss it and make it well.'"

"Stop!" Drake said. "You make it sound nauseating."

"It *smells* nauseating!" boomed a voice from the door. "This whole ship is beginning to smell like a chicken coop!"

"Duck coop," MacDonald corrected as Captain Dumbrowski came on in.

"Where are you taking that?" Dumbrowski asked, pointing at the wheelbarrow.

"To the disposal. Why?"

"Well, we can stop that right now! You're an engineer, it says here; you ought to be able to figure it out."

MacDonald stopped and wiped his forearm over his dripping brow. "You mean clogging the disposal? Nah. There isn't that much."

"There will be; there will be. Drake! Are these figures you gave me on feeding correct?"

Drake dusted crumbs of feed from his fingers, and walked toward Dumbrowski. "I'm pretty sure they are—why?" As he walked, the ducklings followed lovingly.

"According to this, each one of those ducks will eat approximately seventeen kilos of feed in the next fourteen weeks. At the end of that time, they'll mass about four kilos each."

"That's right."

MacDonald dropped his shovel. "By the Seven Purple Hells of Pailin! Nearly sixty-five thousand kilograms! The disposal won't take it—not by a long shot!"

Drake said: "Well, I'll admit there'll be more per day as the ducks

grow, but—" Then he stopped. "What can we do?"

"Do? There's only one thing we *can* do. Dehydrate the stuff and dump it overboard!"

Drake looked down at the ducklings clustered around his feet. "But we can't do that! We've got to reclaim the grit!"

"Grit? What do you mean *grit*?" Dumbrowski asked.

"Sand and gravel. Ducks don't have any teeth, so they have to eat a certain amount of grit to grind up the food in their crops. Without it, they'll die. But there isn't enough on board. We were going to hatch these birds on Okefenokee, where there'd be plenty of it, so we didn't bother to bring any along."

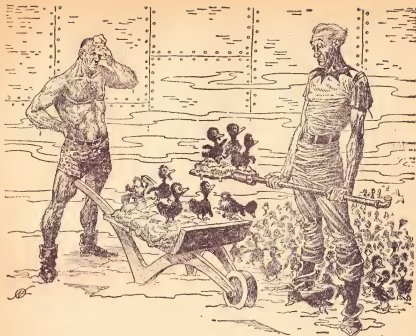
"Then what the devil have you been doing?"

"Re-using what we have. It isn't digested, of course, so I've been reclaiming it as fast as it's eliminated, sterilizing it, and giving it back to them."

Dumbrowski put a hand over his eyes. "Let me think."

MacDonald and Drake stood there silently while the captain cerebrated. Finally, he took his damp hand away from his eyes and looked at MacDonald. "The A stage will have to be disconnected and used separately. We can dehydrate the stuff and take the sand out, but the organic section—well, that simply can't be overloaded. It'll have to go outside."

"I can do it," said MacDonald. "But it'll mean we'll have to dump



it out the air lock at least once a day."

"You can do it when we go out to get new cans of food. Make it all one operation," said Drake.

"Yeah," said Dumbrowski. "You know," he went on, with a touch of bitterness in his voice, "this isn't a spaceship—it's a sea anemone!"

"I see what you mean," said Drake.

Overhead, two ducks flapped by.

Two men stood in the decompression room of the air lock while the pumps labored to reduce the pressure to zero. Their spacesuits swelled a

little as the air left the room, and between them, a box of grayish powder churned softly as the atmospheric gases between the particles of powder worked their way out.

"Are you sure you'll be all right, Doc?" MacDonald asked.

"I think so. With this nylon rope to anchor me, if I get nauseated again, you can pull me back."

"Well, it will be easier with two of us, but Devris could have gone instead."

"He's got to keep shoveling. I can't scrape up the stuff from the floors," he explained.

"Oh? Why not?"

LOOK OUT! DUCK!

"Because I can't keep the ducks away from me. Every time I lift up a scoopful, I get three or four ducks with it!"

MacDonald shook his head inside the bubble of his space helmet. "Poor mama duck. Or should I say Papa Drake?"

"You should say nothing of the kind," the doctor said.

The "all clear" light winked on, and MacDonald opened the outer door.

"You go out first, Doc. Ease yourself past the barrier field slowly. Keep a hand on the edge of the door. And remember, you're not falling. Just keep your eyes open."

Drake did as he was told, and, in a few seconds, he was outside the ship and outside the paragravity field.

"How do you feel?" MacDonald's voice came over the phone.

"All right. A little confused, but I'm not sick. And everything isn't spinning around."

"O.K.; I'll be right with you." He came out, dragging the heavy box with him. "Now, can you clamp your boots onto the hull? They'll come on automatically; all you have to do is put them flat on the metal." He demonstrated, and Drake followed suit.

"I'm O.K., now," he said. "Here—let me carry the box while you get the food."

"Fine." MacDonald raised a gloved finger and pointed. "The dumping ground is right back there near the tail."

Drake looked around him. Here and there, spread over the outer hull of the ship, were fantastic-looking shapes—various pieces of the cargo which had had to be taken outside. He could see the incubator looming queerly in the dim illumination of the far-off stars.

MacDonald was making his way toward a jungle of steel drums which held the duck food. Drake watched him for a moment, then started walking toward the tail of the ship.

It was an eerie feeling; the ship was big, but it wasn't big enough to make one feel one was walking on a planet. The horizon was much too close. His boots were a little difficult to handle at first; the magnetic soles stuck tenaciously to the hull and had to be pulled off with each step. Finally, he found it easier to shuffle along, sliding the magnets over the hull.

Ahead of him, he saw a huge white patch on the hull. His helmet light gleamed off its surface. The dumping ground. He shuffled into the area, his boots raising clouds of the stuff, which only settled very slowly under the feeble pull of the ship's orthogravitational mass.

When he reached a spot near the middle of the heap, he turned the box upside down to dump it.

Nothing happened. The stuff just stayed in the box.

Sure, he thought to himself, grinning; not enough pull to make it fall out of the box.

Well, that was easily solved. With the box still held upside down, he shoved down hard, and then stopped the box. The powder, with its inertia undiminished, went on out, moving toward the hull. It hit—and splashed!

Like a liquid, the powder sprayed out in all directions, enveloping Drake in a white cloud.

He tried to back away from it, but instead of backing, he jumped. His boots came loose from the hull. He was drifting, weightless, in a cloud that was as impenetrable as heavy fog. His helmet light illuminated the particles a few feet in front of his face, but beyond that, there was nothing.

For a moment, nausea threatened to further complicate matters, but he forced it down. "Mac," he said steadily into his phone, "I think I'll need a little help."

"Yeah? What happened?"

Drake told him.

"Have you still got the box?" MacDonald asked.

"Yes."

"O.K." There was a feeling of stifled laughter in MacDonald's tone. "I'll go back to the lock and pull you in on the nylon rope."

A minute or so later, Drake felt a slight tug on his rope. And that was all. Just the first slight tug, then nothing. Had his rope broken?

"Mac!" he yelled frantically. "I think my rope broke! I'm lost!"

"Take it easy, Doc; take it easy. You're O.K. I just gave enough pull on the rope to get you started in this

direction. You'll drift on in. I'm taking up slack now."

Drake didn't feel as though he were moving. "Taking up slack? Are you sure? Why don't you keep pulling?" His voice sounded strained, and it boomed loudly inside the helmet.

"If I kept pulling, I'd accelerate you. I don't want to brain you or something. Ahhh! Here you come!"

The white cloud was thinning, now, soon Drake could see that he was, indeed, drifting toward the air lock.

He moved in near MacDonald. The engineer reached out, grabbed his legs and pushed them down toward the hull. The boot magnets grabbed hold.

"Let's get inside," MacDonald said. "This suit is beginning to itch."

"Itch? Hell, this is the first time I've been comfortable in five weeks!"

"Yeah? Well, I itch. Say—how come you walked out into the middle of that to dump the box? That won't settle for days."

"It looked higher out in the middle—I thought that's what you had been doing."

"Naw! I walk up to the edge and give the box a shove. The stuff slides along the hull plates and piles up in just about the middle. Didn't you see the drift marks?"

Drake nodded. "Sure, but I thought it was just the wind—" He stopped and felt his face going a bright red.

How stupid can you get? Wind? *In space?*

But MacDonald only said: "Boy, will I be glad to get this suit off and scratch."

The next day, MacDonald was sick. His eyes were swelled almost shut, and his skin was covered with red, blotchy patches that itched like fire.

While Dumbrowski and Devris labored over the feeding and the cleaning, Drake labored over MacDonald. The man was feverish and miserable. The high temperature and the humidity hadn't helped any.

Dumbrowski, worried, got the ducks fed in short order and hurried up to MacDonald's cabin as fast as a one-point-five gee would let him.

Drake had pumped several shots into the engineer's blood system, and sprayed his skin with a soothing semi-anaesthetic lotion. The swelling was beginning to go down a little.

Dumbrowski stood at the door, waiting for him to finish; when he was, the captain motioned with his hand.

"What's the matter with him? Is it contagious?"

Drake shook his head. "No. Simple allergy reaction, that's all. He'll be all right."

"Something he ate?"

"No—he's allergic to duck feathers."

Dumbrowski leaned against the wall, and said nothing for a long moment. "I think I could cry," he said after a bit. "I honestly think I could cry. Can't cure him, I suppose?"

"Not with what I have on board. All I can do is keep the reaction down. He'll have to stay away from the ducks from now on."

Dumbrowski looked at Drake. "You know," he said philosophically, "when this trip is over, I think I shall apply for a vacation in the Martian uranium mines. I understand it's very pleasant."

Drake listened to the *scrape, scrape* of the shovel as Dumbrowski pushed it over the deck. It was a good thing the decks were covered with plastic; it would have been impossible to keep bare steel clean by scraping alone.

The doctor had put a small amount of the sterilized grit into a test tube and added hydrochloric acid. He held it up to look at it. Behind him, he could hear Dumbrowski's heavy breathing.

"No bubbles," Drake said. "No lime."

"What?" the captain asked wheezily.

Drake turned around. "There's no lime left in the grit. It's supplied in the form of crushed oyster shell; the birds need it for bone formation now and egg formation later. It dissolves slowly, so most of the oyster shell is excreted intact. But this grit has been reprocessed so many times that there's no lime left."

Devris pushed open the door and trundled in a can of feed on the improvised wheelbarrow. He listened for a moment to the gasping breath of the captain and watched the wor-

ried look on Drake's face. "How much of this can the human system stand?" he asked, of no one in particular. "Mac has eczema, the skipper is coming down with asthma, Drake has ducks, and I have the galloping heebie-jeebies."

Dumbrowski ignored him. "What about this lime, Doc? Can they do without it?"

"Not at this stage of the game; it'd kill them to go without it for very long."

"I will gladly sacrifice my useless bones to be ground up for duck food," Devris volunteered. "Or, if that seems drastic, we can all pull each other's teeth."

"Very funny," said Drake sarcastically.

"It isn't so funny, at that," Dumbrowski told him. "We haven't got any lime on board. Why didn't you think of this before?"

"It's never come up before," Drake said, irritated. "We know how much oyster shell to give them, but the amount that's actually absorbed has never been computed because there's no necessity for it, usually."

"Well, you still should have mentioned it before now!" Dumbrowski's voice was tight.

"Hey! Hey!" Devris interrupted. "Don't go flying off the handle, you two! That fire hose, you know, still works." He set the can of feed gently on the floor, shooing ducks out of the way.

"You know the trouble with you two guys?" he continued. "You, Doc, know everything about ducks

and nothing about spaceships. And the skipper knows everything about spaceships and nothing about ducks. And neither of you knows which bit of information is vitally necessary for the other. And you both think the other is playing it dirty by withholding information."

"You're right," said Dumbrowski, cooling perceptibly. "I'm sorry, Doc; now, let's think about this."

"Lime, you say. I'm not much of a chemist; isn't that calcium oxide?"

"Not in this case. 'Lime' can be calcium oxide, or calcium hydroxide, or calcium phosphate, or calcium carbonate, depending on who's doing the talking. In this case, it's the carbonate."

"You couldn't use calcium chloride, I suppose. We've got plenty of that in the emergency air purifiers."

"I'm afraid not. It'd have to be the carbonate."

"Hey!" Devris said suddenly. "I'm no chemist, either, but couldn't we add carbon dioxide to it or something?"

"Not unless we had plenty of sodium hydroxide or the like—"

"We do!" said Dumbrowski. "We've got that in the air purifiers, too! It takes the CO₂ out!"

"Then we've got it!" Drake was excited. "We run enough carbon dioxide through it to make sodium carbonate; then we mix the calcium chloride with it! The calcium carbonate formed will drop to the bottom because it's insoluble, leaving sodium chloride in solution! It's perfect!"

Then his face fell. "But we can't tamper with the air purifiers, can we?"

Devris and Dumbrowski both grinned. The navigator said: "That proves my point—you don't know enough about spaceships."

Dumbrowski said: "These are the emergency purifiers. As long as the electronic purifiers work, we don't use the chemicals—too inefficient. We only have 'em aboard in case the electronics go out—and they're in good condition. Besides, we shouldn't have to use all the chemicals. About how much would you need?"

"I'll have to figure it out from the lime removed from the grit, but it shouldn't be too much."

"Good! We're all set, then."

More weeks passed. The brooders were taken outside to make more room as the birds increased in size and need for living space. By the end of the sixteenth week, the *Constanza* was full of ducks. From engine room to control dome, there were nothing but ducks—ducks that waddled and quacked and flapped their way freely through the huge ship. All the doors were left open now, except those which sealed off the engines and the control rooms and the sleeping compartments. Everywhere else, there were ducks. Thousands of ducks.

It had been hard work, but the pressure was beginning to let up a little as the hour of their rescue approached. None of the men had had too much sleep, and all had lost

weight. Even Dumbrowski was beginning to look hollow-checked.

To Drake, everything was fine; his ducks were in fine fettle, all of them. The tanks that had been built and flooded for swimming purposes were being used as the older ducks taught the young ones to swim. Everything was fine except for one thing—he still didn't understand the odd aloofness that concealed Dumbrowski's anger. Why should the captain be sore at Drake *before* the accident happened? The remark about "Drake and his harem of ducks" still rankled.

He didn't understand it until one evening when Devris broke into song. Dumbrowski was not in the little common room when it happened; he was in his own cabin.

Devris was singing: "Old MacDonald had a ship, E,I,E,I,O! And on this ship, he had some ducks, E,I,E,I,O-O-O! With a *Quack!* *Quack!* here, and a *Quack!* *Quack!* there, here a *Quack!* there a *Quack!* everywhere a *Quack!* *Quack!* Old MacDonald had a ship, E,I,E,I,O-O-O-O!"

When he'd reached the part where he said "here a *Quack!*" he'd indicated Drake with a thumb. The doctor grinned good-humoredly. MacDonald was laughing uproariously.

Devris had started with the second verse: "Old MacDonald got the itch, E,I,E,I,O!"

"That's a lie!" bellowed Dumbrowski's voice from the door. They all stopped and looked at him. It

was quite obvious that he had been hitting the Irish bottle.

"No it isn't, skipper," Devris said. "He does have the itch."

"I mean about the ship! This is *my* ship! It ain't Old MacDonald's ship, or Drake's ship, or the ducks' ship! It's my ship, and I'm captain here!" He swung around to Drake. "You understand that, Quack?"

Drake didn't mind Devris calling him that, but when Dumbrowski did, it made him see red. He stood up. "What makes you think I care who runs this dirty tub?"

"Dirty tub! Who made it dirty? You! You and your *carte blanche* orders from the Commission!"

MacDonald and Devris were both on their feet, moving to block off the captain.

But Drake said: "Wait a minute! What's all this about? What *carte blanche*? I don't know what you're talking about!"

Dumbrowski said something foul. Then he added: "And I don't care what the Commission does, either! I'm captain here! See!" He turned back into his cabin and came out again with two sheets of flimsy.

"Here!" He threw them at Drake. Then he slammed the door, leaving the three men alone.

Drake picked up the papers and read them.

"What does it say, Doc?" MacDonald asked.

Drake looked up slowly. "He must have got this before take-off. It says that Dr. Rouen Drake is entirely responsible for the cargo, and that any orders pertaining to the cargo should be obeyed."

Devris whistled softly. "Wow!"

"No wonder he's been sore!" MacDonald said.

Drake swore, borrowing some of Dumbrowski's vocabulary. "How stupid can they get! I swear to you, I didn't ask for any such thing. I thought I was just bucking the skipper's bullheadedness. I wonder why he didn't say something about this before?"

"He probably assumed you knew," Devris said. "He should have said something about it though."

"I'm glad he didn't," Drake said softly. "I've learned a lot in the past eight and a half months."

"What do you mean?"



"I was so stupid then that I might have tried to give orders." Drake's voice was very low.

The captain of the cargo ship *Stramaglia* looked out of his control blister at the mass ahead.

"It most certainly does *not* look like the *Constanza*," he said. "I wonder what those things are sticking out all over it? And why is it painted white?"

"May as well find out," said his engineer. He held his helmet globe under his arm. "Jones and I will go over and take a look."

Captain Dumbrowski and his crew were waiting for the men from the *Stramaglia* as soon as they came in from the air lock, their spacesuits coated with white powder.

Martin, the engineer, and Jones, the navigator of the rescue ship, were confronted by three tired-looking, almost emaciated men. The newcomers found one-point-five gees difficult to bear, but the men from the *Constanza* seemed to be used to it.

"Don't take your helmets off just yet," Dumbrowski said. "The air pressure in here is pretty high. Let it leak in."

"O.K.," said Martin. "By the way, what is that white stuff we got all over us?" At the same moment, he cracked his helmet just a little, and a hissing jet of the ship's atmosphere hit him in the face. He flinched. "And what's that smell?"

"Duck excrement," said Dumbrowski, with a ferocious grin.

"These men are Lieutenant Devris,

my navigator, and Dr. Drake, in charge of ducks. My engineer, MacDonald, is confined to quarters for being allergic to ducks."

"Uh . . . I . . . uh, yeah. Sure. Are you ready to start work on the control systems?"

"Let's go," said Dumbrowski. "And mind the ducks."

"Huh?"

"Never mind—come along."

"This place isn't so bad," said Devris. "It isn't nearly as hot as I thought."

Dumbrowski looked around him at the scenery of Okefenokee. Overhead hung drifts of clouds, through which a bright yellow sun blazed. "It isn't as hot as it was on the ship. This is in the southern hemisphere; the ducks are to be set free farther north, nearer the equator."

"Have they got the ducks unloaded yet?"

"Yeah," said Dumbrowski. "Now they're airing it out and washing it down."

The *Constanza* and the *Stramaglia* towered high over the little cluster of buildings around the planet's one small spaceport. So far, the planet only had a population of eighty, and these were mostly ecologists and biologists studying the planet. It wouldn't be fit to really colonize for a while yet.

They had been on the planet less than twenty-four hours, but they had been ordered to return to Earth as soon as practicable—which meant immediately.

MacDonald was walking toward Dumbrowski and Devris, holding a sheet of paper in his hand. "Communication from Earth," he said, handing the sheet to the captain.

Dumbrowski read it and said: "What the devil? Listen to this: 'Excellent job on preserving shipment to Okeefenokee. Citation is being placed in your promotion file for job above and beyond call of duty. Congratulations.'" He looked wonderingly at MacDonald and Devris. "How could that be?"

"Devris—tell him," said MacDonald.

"Drake worked it out," Devris explained. "That stupid order wasn't his idea. He didn't even know anything about it. So he wrote a report that ought to keep the top brass from ever pulling a stunt like that again."

"But . . . but . . . how?"

"They'd put him in charge of the cargo, hadn't they? Well, remember Section XIX, Paragraph Seven?"

"No."

"Well, Drake did after seeing it once. It says that the cargo officer is responsible for all damage due to shifting cargo, because it's his job to make sure it doesn't shift—follow? Well, technically, a duck is cargo in this case, and if it shifted—or walked, or flew—in such a way as to damage the ship, it's the cargo officer's fault. And that message you got from the Commission technically appointed him cargo officer. And that's against regs, because the *Con-*



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stanza only rates a three-man crew. Drake tied 'em up good."

"But what will they do to him?" MacDonald asked.

Dumbrowski grinned. "Nothing. What can they do? He's not a member of the Space Service."

"They could give him a commission and then bust him," Devris said helpfully.

The voyage home would be pure vacation. It would be cool and comfortable, and a one-gee pull all the way. Nothing to do but loaf and get soft after eighteen weeks of hell.

The *Constanza* lifted comfortably from the surface of Okefenokee and speared Earthwards at ten thousand light speeds.

"Ahhhh!" said Dumbrowski. "Feel that air! Smell that air! Deelightful! Open another beer."

"Glad to," said Drake. "I am going to enjoy this trip."

Dumbrowski hadn't apologized, and Drake hadn't even worried about it. Each knew how the other felt.

"I'm going to have to juggle my books," Drake said, sipping at his beer. "Otherwise, I'll get hell when we get home."

"How's that?" Devris asked interestedly.

"Evidently my egg count was off. I know how many ducks died *en route*—about average. But I must have miscounted the number of eggs that didn't hatch. I was one short."

"What'll they do? Charge you two thousand bucks for it?"

"Nope. I'll just add one to my bad egg count, that's all."

"Damn!" said MacDonald. "I itch!" He scratched furiously at his arm.

"Maybe there's a duck feather around," said Devris.

Then they heard a far-off sound, and all four men stared at each other in horror. They knew, then, why MacDonald itched, and what had happened to the extra duck.

The sound came again.

Somewhere a duck quacked.

THE END



FUSION FOR POWER

The basic power-source in the universe appears to be the fusion reaction. Stars depend on it; uranium fission is a sort of second-hand nuclear energy, and quite limited. Fusion, and not in a bomb, seems to be on its way as a controllable human power source.

BY MILTON A. ROTHMAN

It may come as a shock to some of you science-fiction readers, but the uranium reactor is about to become obsolete. You have just become accustomed to thinking and writing of atomic energy as the power source of our future society. You have gotten used to the jargon of reactors, fraught with terms such as moderators, neutron flux density, breeders, radioactive wastes, et cetera. Now it is time to look beyond this and get up to date on what will really be the final and permanent power source in the future world.

Well, permanent for a while, anyway.

From the stirrings and gropings

taking place at the present time, it begins to appear that the use of uranium fission for power is but a temporary measure—a stopgap to keep things moving and people occupied until the hydrogen-fusion reaction is put under control.

When this will take place is something that even a science-fiction writer would find it hard to guess. H. J. Bhaba, the leading theoretical physicist of India, optimistically gives us twenty years before we subdue the power of the hydrogen bomb for peaceful purposes. This estimate may or may not be colored by political considerations. We do know that the practical obstacles in the way of this accomplishment are

so fantastically formidable that at the present time we can just barely conceive of doing the job at all.

However, considering past performance, it would indeed take a faint heart to say that scientists cannot accomplish any task which they see as a theoretical possibility.

This is especially true in view of the fact that the controlled hydrogen reaction is not merely a nice thing to have as a laboratory stunt, as a feather in our caps, as a sign of our technical prowess. Due to the ever-increasing energy hunger of the world, this new source of power simply *must* be developed if our civilization is to be kept going at the present rate.

Whether we like it or not, the world is becoming more and more filled with people, and these people are using energy at an ever increasing rate. Not only are the Americans contributing to the planetary traffic jam with mounting hordes of automobiles, but Europeans, Asians, and Africans are beginning to feel that they, too, ought to get into the act.

This means that the demand for gasoline and other petroleum products must continue to rise at an explosive rate. Yet, as Eugene Ayres points out in *Scientific American* (October, 1956), the most optimistic estimate of the world's petroleum supply shows that the production of oil must start to fall off before the end of the present century and decrease to almost nothing in a few hundred years. The same estimates

hold for coal, natural gas, and other fossil energy sources.

We see that in a short time the use of combustible fuels will certainly be unable to keep up with our civilization's hunger for energy.

Would solar energy serve? Undeniably, an efficient use of the sun's radiation would be very useful in filling in gaps and doing specialized jobs. However, some estimates of the Earth's energy requirements a hundred years from now are so tremendous that the solar energy falling on all the land area of the world would hardly satisfy it.

Clearly, in another hundred years, people are really going to be scrounging around for energy in all sorts of forms.

We are forced to consider nuclear energy in its various aspects. Uranium fission we have, and it is being put to use. The thorium reactor will undoubtedly prove an even greater supply of energy. Estimates of our reserves of fissionable materials claim its magnitude to be over twenty-five times that of oil, gas, and coal. Even at that, in another hundred years these materials will be gobbled up at such an appalling rate that their usefulness will have a very definite limit.

This is but one side of the coin. The other side is the hideous prospect of the annual disposal of billions of curies of radioactive waste products which must appear when fission reactors become as common as steam turbines. The smog problem

produced by our combustion machines will seem like an infant's game in comparison.

These are problems which not even science-fiction writers have thoroughly explored. Always it is assumed that somehow things will get bigger and bigger, that somehow we will always have enough energy to go around. Those who have dealt with the subject of radioactive contamination have always thought of this as an aftermath of war. Peace has problems equally great.

Many scientists have been attacking these problems, and are now in a position to see where an answer may come from. As of now they do not actually have an answer, but they can see the direction of success.

As a matter of fact, this work has been going on for at least a decade, but it has been only in the past few months that we on the outside have been let in on some of the secret. Interestingly enough, the first real break in the silence was made by the Russians. I quote the editor of *Nucleonics* (June, 1956): "The most dramatic and significant event since the Geneva conference came with Russian scientist Igor Kurchatov's astonishing talk on fusion power, delivered during a visit to Harwell (England's atomic energy center) on April 26th. With this one speech the Russians moved well ahead of the United States in the extent of declassification of thermonuclear information."

This must be recognized as an abrupt reversal of the Russians'

behavior, for the past decade has been noted for the paucity of nuclear information from Soviet laboratories.

Possibly in reply, American secrecy was pierced in the July, 1956 issue of *Reviews of Modern Physics*, one of the major physics journals. In an article entitled "Controlled Fusion Research — An Application of the Physics of High Temperature Plasmas," Richard Post, of the University of California Radiation Laboratories, reviews some of the theoretical approaches to the problem.

He asks the question: What supply of fuel exists which is practically inexhaustible, and which can be used in a practical way? The answer, in an odd way, is not surprising: it is the source of life itself — the ocean.

Spread throughout the vast mass of water on the earth is a supply of the element deuterium which contains enough usable energy to last us for millions of years.

The problem is: how do we get this energy out in a useful form?

There is nothing secret about the properties of deuterium, either chemical or nuclear. It is simply heavy hydrogen, and makes up about 0.015% of all the hydrogen in all the waters of the earth. It may be separated from ordinary hydrogen without too much trouble, and in several well-known ways.

From a nuclear point of view, the important fact about deuterium is that its nucleus consists of one

neutron and one proton which are bound together to form a single particle. This particle is called the deuteron. The deuteron has a single positive electric charge, and a mass which is approximately twice that of a proton.

In any laboratory which possesses a high voltage generator capable of producing more than a few hundred thousand volts—such as a Van de Graaff generator—one can investigate the reactions which take place when a beam of high-velocity deuterons bombards various elements. The most interesting reactions take place when deuterons are used to bombard a target of deuterium gas, so that deuterons combine with deuterons.

Two main reactions occur: a deuteron may combine with a deuteron to produce a nucleus of helium-3 plus a neutron, at the same time releasing 3.25 million electron volts (Mev) of energy. Most of this energy goes into the kinetic energy of the neutron. Or, alternatively, a deuteron plus a deuteron may produce a nucleus of tritium (hydrogen-3) plus a proton, with the release of 4 Mev of energy.

Now 4 Mev represents only a small amount of energy—it is only 6.4 millionths of an erg. However, one gram of deuterium has 3×10^{23} atoms in it, so that if all of these react with each other, quite a considerable amount of energy is released—over 26,000 kilowatt hours, in fact. Furthermore, although a single fission of a uranium nucleus

gives about 100 Mev energy, deuterium is so much lighter than uranium that the fusion reaction gives over twice as much energy per gram of fuel.

So we see that the reaction is a simple and fruitful one. One nucleus of deuterium combines with another nucleus of deuterium, and energy comes out. Obviously, there must be a fly in the ointment—otherwise all the deuterium in the ocean would have exploded billions of years ago, and there would be nothing left but helium.

The reason is simply that deuterons, being positively charged, repel each other. Once they get within touching distance of each other, they waste no time in combining. But in order to do that they must first be moving fast enough to overcome that electrostatic repulsion.

It's like falling over a precipice guarded by a fence. You have to climb over the railing a short distance before you can make the long drop.

In the laboratory we can get over this "potential barrier" by slamming deuterons at one another with an atom-smashing machine. Unfortunately, trying to get power out of this sort of system is like trying to run a locomotive on a box of matches, without the coal. You just don't get enough out of it.

Somehow, we must take a whole tankful of deuterium and we must induce the atoms in it to dash about

with enough speed to get through the electrical repulsion. Each deuteron must have enough kinetic energy to overcome the electrical potential energy. At ordinary room temperatures the average kinetic energy of a deuterium atom is only a small fraction of an electron volt. Some tens of thousands of electron volts are necessary to make deuterons combine often enough to make the reaction useful.

It would seem, then, that all we need do is to heat the gas sufficiently, causing the atoms to fly around more violently, and the deuterons will oblige us by reacting with each other. This, of course, is what takes place in a hydrogen bomb. The initial fission explosion raises the temperature enough so that the fusion can take place—all at once.

Something a bit different is desired for the generation of power. We want the reaction to start without the use of a fission reaction, and we want it to continue at a uniform rate under controlled conditions. We want it to be self-sustained—that is, the heat produced by the reaction must be enough to keep itself going.

People have been able to calculate the conditions under which the deuterium reaction will sustain itself.

Imagine this situation: We have some sort of container filled with rarefied deuterium gas. The density is only one ten-thousandth the density of the atmosphere—indeed, what we are talking about is a fairly

good vacuum. The deuterons are dashing about with tremendous speeds—their average kinetic energy is one hundred thousand electron volts. This corresponds to a temperature of one billion degrees centigrade!

Let us understand, however, that since the gas is so rarefied it does not radiate as much heat as would a denser body at that temperature. Otherwise, everything in the neighborhood would be destroyed, and there would be no way of keeping this reaction bottled up.

This is one of the factors that makes the entire project feasible, and it is worth considering, since it is a point which is generally misunderstood. When we speak of a chunk of matter at a temperature of one billion degrees, we tend to picture a piece of material plucked from the center of the sun, intensely incandescent, and radiating enough energy to burn up everything within miles.

However, a rarefied gas at such a high temperature acts quite differently. The corona of the sun, for instance, is exactly such a gas. Yet we are aware of much more energy coming from the denser surface of the sun itself, at a temperature of only five thousand degrees. When we speak of the temperature of a low density gas, we are really just giving a measure of the kinetic energy of the atoms. (I speak of atoms, rather than molecules, for molecules just don't exist at a billion degrees.)

Now here is what has been calculated about the little situation we have described: a tank of deuterium at one billion degrees temperature and one ten-thousandth atmospheric density. It has been calculated that under these conditions there would be enough fusion reactions taking place to generate one hundred watts per cubic centimeter of gas. This is the same kind of power which is obtained in a fission reactor, and, therefore, this situation has been used as a typical example.

This is very nice. Now a problem arises—one of these minor engineering details that insists on cropping up in the most well-behaved experiments. How are we going to bottle up this demon? For it turns out that the pressure exerted by this gas we have been talking about would be about 15,000 pounds per square inch! Clearly, a metal tank would be inconvenient.

It would be inconvenient not only because of the pressure, but because the deuterons would quickly smash into the walls of the tank, heat the tank up, react with the materials in the tank, introduce poisonous impurities into the gas, and in general create quite a bit of havoc.

We must also think of this: Inside the tank there is mostly empty space, with a deuteron here and there. A deuteron moving within this space must travel on the average a certain distance before it collides with another deuteron and generates energy. For the situation we have assumed, this distance, or "mean free

path" is approximately the circumference of the earth!

This means that a deuteron would be much more apt to escape completely from the innards of the container before even engaging in a reaction with another deuteron. Somehow, a method must be found which keeps the deuterons circulating within a confined space and prevents them from ever reaching the walls of the container. I repeat: a practical method for thermonuclear power must involve a container built in such a way that the stuff inside the container never really touches the walls of the container.

Now, a science-fiction author would know immediately how to solve this problem. He'd say: use a force field to enclose the deuterons.

Unfortunately, science-fiction writers know more different kinds of force fields than do physicists.

Physicists know of gravitational fields—much too weak for the purpose, and in the wrong direction, anyway. Meson fields—too short-ranged. So electromagnetic fields are all that remain, and ideas in this direction are being pursued briskly.

One idea which is being explored in many places is the "pinch effect." Many generations of electrical engineering students have been taught that if you take a pair of parallel wires and pass an electric current through both of them in the same direction, then they will be attracted to each other by the magnetic fields around the wires. The same thing happens, in effect, if you pass a

current through a cylindrical tube containing an ionized gas—such as a container of deuterons.

It is as if you had a lot of little wires running along the tube. They would all be attracted to each other. In the same way, the magnetic field of the current causes the atoms of the gas to be forced towards the center of the tube. There is a constriction, a squeezing: the pinch effect.

Here is a possible way to keep the deuterons bottled up, without the touch of material walls. Again, a few practical details get in the way. For the tank of deuterium we have been talking about, the amount of electric current necessary to overcome that 15,000 pounds of pressure is in the neighborhood of ten million amperes!

After we recover from this blow, we discover that a couple of bright theoretical physicists have proven that the pinch effect is an unstable phenomenon when created by a steady current. It tends to break up after a few microseconds.

The problem, then, is not merely to create the tremendous currents necessary for the pinch effect, but to keep the effect going long enough for some energy to be generated.

The experimenters up to now—at least as far as reported in the journals—have been engaged mainly in shooting very short bursts of current through tubes of gas. The Russians we mentioned before speak of discharging 50 kilovolt condensers to give a peak current of two million

amperes for a fraction of a microsecond.

They also report getting a burst of neutrons appearing simultaneously with the current pulse, and this would lead one to throw hats in the air and claim the production of thermonuclear reactions. However, it turns out that this is a fluke—a completely new sort of effect is taking place. When the gas contracts rapidly due to the establishment of the pinch effect, deuterons are forced towards the central axis of the tube. This contraction is so sudden that the deuterons acquire enough energy to react with each other. A new sort of magnetic accelerator has been created, but thermonuclear power has not really been accomplished.

One of the most exciting possibilities mentioned by the theoreticians is that energy might be picked up directly as electricity from a fusion reactor. This is because the tankful of hot deuterons is a plasma of charged particles, and by expanding against a magnetic field it can transfer energy to the outside. This could possibly be a very efficient process, and if carried out successfully it could change the entire complexion of our power generating philosophy. We could dispense with boilers, heat exchangers, and the other loss-producing paraphernalia of heat power engineering.

To go from the theory to a practical power plant is going to be a real job. It would be silly for an outsider to make predictions because

there is no way to tell how much has already been done. Even physicists often know only what they read in the newspapers. The number of unclassified—meaning unsecret—papers in this field has been somewhat less than a torrent.

We do know that even prior to the end of World War II some of the basic work in fusion reactions had been done by Fermi, Teller, and others. Since then these studies have been co-ordinated under the name "Project Sherwood," and work has been carried on at Los Alamos, Princeton, Livermore (California), and at other places.

An interesting example of how frustrated administrators may become in trying to compartmentalize knowledge and promote secrecy is the case of Lyman Spitzer, Jr. An astrophysicist at Princeton, he was familiar with the behavior of ionized

gases under the influence of electromagnetic fields, for these are things encountered in the atmosphere of the sun, and also in the vast reaches of the galaxies themselves. This covers a range of events from the creation of cosmic rays to the motion of solar prominences. But this is just the sort of thing we have been discussing in relation to generating power by fusion.

Therefore, unaware of secret work going on at Los Alamos, Spitzer proposed his own ideas to the Atomic Energy Commission, and found himself head of a project at Princeton to pursue this work further.

From astronomer to power engineer—a feat worthy of a science-fiction type scientist, in a project where the imagination and ingenuity of science-fiction scientists are sorely required.

THE END

DEFINITION

An Authority is an individual who is not required to defend his intuitive opinions; other people are required to be logical.



RED ROVER

The Aliens had a simple formula for beating down the human space crews; they could stand fantastic accelerations. But there is always, somewhere, some tougher entity . . . if you can think to employ it!

BY DEAN C. ING

Illustrated by van Dongen

The colonel stood massively before the shack's only functioning viewscreen, staring at it intently as he leaned on spidery aluminum crutches. The big man swayed around, hearing Mayhan's scuffling steps, then returned his gaze to the screen.

"The *Pink Pup* checked out fine,

Colonel Meier," Mayhan said. "I could scramble anytime now."

The older man stiffened slightly. "Your ship is the Terran Federation Scout three-seven-six-six, lieutenant. You will kindly remember that." He spoke without turning. "We may be getting shot to blazes here, but we're still a military unit."

Mayhan risked a shrug. "Yes, sir."

"The sixty-six . . . the *thirty-seven* sixty-six," the colonel corrected himself quickly, "isn't your personal plaything."

"No, sir." Mayhan kept his answers meek. There was no point in aggravating one's C.O., especially when he was in constant pain from a shrapnel wound in the hip.

From near the base perimeter, a homing missile shrieked away into the yellow sky of Di Cicco with dreams of predation in its primitive brain. Mayhan sent an awed glance after the missile. As a scout pilot, Mayhan commanded a more versatile machine, but the tiny genius of destruction that was a homing missile always fascinated him. He had a personal interest, too; a single Backer projectile, eluding the homing "birds" high above Di Cicco's lone outpost, might destroy the entire potential of the planet. Mayhan and his ship *were* that potential.

Mayhan took on a military bearing as Colonel Meier turned toward him. He did it well; a sharp-eyed, closely-knit youngster of thirty, Mayhan could, if pressed, become a creature of spit and polish. If only temporarily.

"We're getting clobbered, lieutenant," Meier told him flatly. "I knew it was too good to last. Don't know why the Backers waited so long."

"Perhaps our other ships called attention to us, sir," Mayhan offered. "If they took one of our guys in-

tact, they'll know we have data that can hurt 'em."

"And so we have." Meier permitted himself a frosted smile. "Too bad we don't have facilities any more, or we could microfilm everything. As it is, our maps and psychomotor data on the Backers give us a high card. But the Federation'll have to play it for us," he grunted. "If only we'd known what was out here," he trailed off, a dull luster in his eyes.

Six months before, Di Cicco had been a perfect duty planet, discounting the lack of female companionship. Routine mapping missions on the rim of known space, deep-sea fishing on Di Cicco's placid ocean, high-diving under a feeble gravity constant—the outpost was a model for Federation Service recruiting posters on thirty worlds. And then the Backers came darting in with their outrageous little ships, bypassing Di Cicco temporarily on their way into Federation territory.

Colonel Frederick Meier had the agonized distinction of being the first man to contact a Backer ship; he was the only one who'd gotten close to the Backers and had lived to regret it. His wound, healing slowly, was a souvenir from a Backer torpedo that had caught Meier's ship even as the colonel was ducking into Di Cicco's atmosphere. There was no communication with the aliens, only contacts; they came; they took. Their weapons and intellect seemed to be on a par with those of the Federation, but with-

out much co-ordination. Still, they had cut off a prime source of information when they set up their flexible picket line. Di Cicco, officially, was behind enemy lines. So far, six ships had been stripped and refitted for a dash back to Federation planets. Five had made the supreme effort, beaming back a steady call as long as they functioned. They had all been caught, either in normal space or in hyperspace, in a matter of hours.

Colonel Meier relaxed a trifle, with a look at Mayhan that was not quite fondness. "I won't bandy words," he rumbled. "That billion-dollar vessel out there," he nodded toward the *Pink Pup* as it squatted on the landing area, "is worth a billion times more now. There isn't another available scout this side of Vega, and this data must get to Planning Center."

Mayhan voiced a confidence that was mostly sham. "She'll do it, colonel. Every tech on Di Cicco knows the best ship we have is the *Pink* . . . three-seven-six-six."

Now the C.O. actually grinned, lifting a heavily veined wrist to rub his nose. "You're incurable, lieutenant," he said, "if not inoperable. Well, this time I won't warn you against acrobatics. You're on your own. Maybe you've gotten some good out of treating your ship like a mechanized roller skate. You'll need to do some fancy twisting to run a Backer gantlet."

"I think I can, colonel," Mayhan

said uneasily. He was wondering if the C.O.'s mind had gone soft. The robot satellite that soared above Di Cicco had been transmitting some interesting scenes as Mayhan entered the communications shack. Time, Mayhan thought tritely, was of the essence.

"By the way," Meier asked, "what were your 'G' tolerances at your last physical?"

Mayhan pursed his lips, looked up at nothing for a moment. "Forty G's for point one seconds," he recalled. "Twelve G's for ten seconds, and five G's for as long as my fuel holds out. For a one minute increment—"

"O.K.," Meier cut him off, "so long as you haven't forgotten. Just try to remember," he almost pleaded, "that it's more than a broken blood vessel you're risking. Will you do that for me, Mayhan, as a personal favor?"

"Yes sir," Mayhan mumbled, reddening. The young pilot fidgeted in silence as Meier studied the view-screen again and made a vernier adjustment. Mayhan saw a Backer ship leap into focus, then dwindle. On the screen's panel, a red light winked off; Meier nodded.

"That's it, Mayhan," he said. "Damme if I know what they're up to, but the Backers have left us to our own devices for a while. You sure you can handle the . . . God forgive me . . . *Pink Pup*?"

"If you mean the three-seven-six-six," Mayhan said straight-faced, "Yes sir." Then he bit his lip. One

doesn't make quips to one's C.O.; one laughs when the C.O. does it. Period.

"I resign," the colonel chuckled softly. "Tell Wang and the other techs to get back here on the double, soon as you're off. We have papers to destroy before we fade into the underbrush. And Mayhan," he called as the pilot streaked for the door, "wait until I clear you from here!"

"Will comply, sir," Mayhan returned unmilitarily over his shoulder. He ran easily, shrugging his G-suit into the proper places and patting pockets to make sure of their contents. Bounding across the taxi strip, he waved an arm at Captain Wang, the field-control officer. He stabbed one finger into the air in the time-honored scramble signal. Mayhan found his skin prickling as a ragged cheer went up from the assembled technical specialists. Best bunch of bums in the universe, he thought. And they're counting on me. Then he was riding the lift to the *Pink Pup*'s cabin, repeating Meier's instructions to Wang as the taciturn captain made minor adjustments on Mayhan's G-suit.

Mayhan busied himself inside the *Pup*, double-checking everything. His G-suit stretched across his shoulders and down his thighs to encase his feet without a wrinkle. He left the air lock open, breathing the almost Earth-normal air to conserve oxygen. The viewscreens showed one last tech racing away from the blast area on his scooter, toolbox

spilling gadgetry at every jounce.

The radio crackled. "Lieutenant Mayhan, the area is clear of the enemy," came Meier's voice. Mayhan acknowledged, operating the air-lock servo. The alloy port thunked shut, depriving him of his last sight of Di Cicco's distant hills and spinnaker cloudlets. Hills and cloudlets that would soon be under Backer jurisdiction.

The *Pink Pup* was alive under Mayhan's deft touch as he typed instructions into the console keyboard. "Prepare for launch," Meier droned dispassionately, and Mayhan hit the manual first-stage alert switch. There was the usual pause of interminable seconds. Then Meier spoke again. "Any time, son," he said gently. Mayhan was aloft an instant later.

Mayhan considered his situation while the ship accelerated steadily out of Di Cicco's area. It was too bad that data couldn't be sent by microwave. Then again it could, if you counted hyperspace. Everything seemed the same in hyperspace, once past the feeling of being drawn through a jagged knothole—but it wasn't. For one thing, the trip to Vega VI would take about three days instead of the several centuries it and radio waves would require in normal space. Physicists said that in hyperspace the ship and contents were only a matrix of wave lengths with cohesive properties—whatever that meant. Mayhan didn't care. He did care about the Backers' use of

hyperspace. It wasn't known if they could make an instant jump or not, since the five previous escape ships from Di Cicco couldn't be monitored adequately while in a state of flux. Carrier waves simply fanned out too quickly to be useful over great distances, in hyperspace.

Mayhan only vaguely understood these problems; his most prominent worry was a physical one. He knew that he was physically inferior to the Backers in one important respect.

"I could lick any three dozen of 'em hand to hand," he growled to the ship. "Those greasy little octopi are soft!"

A close scrutiny of Di Cicco's only prize had provided the news that the aliens had no solid bone. Something akin to cuttlebone served the alien—and served them well, considering humans by comparison. The Backers could beat Mayhan easily in space. They could beat any man or Vegan by a freakish ability to take huge gravity loads. Angular course changes seemed to affect them much as they affected humans, but at straight linear acceleration, positive or negative, a Backer was master of the known universe.

Backer ships advertised this ability by the lack of a forward cabin. There were identical ion drives on both ends, making the Backer ships look ridiculous to men. And making them almost impossible to catch or to avoid.

Mayhan stroked the cushioned panel before him. "You can do it,

Pup," he soothed. "The question is, can I?"

He put the query to the autopilot, an inane habit born of dreary mapping trips. He hit the MESSAGE ENDS key and instantly saw the expected answer slide out like ticker tape. The *Pink Pup*, he decided, didn't think much of her master.

Mayhan had been in favor of sending robot controlled scouts past the Backers, rigged for evasive action. Meier had coolly voted him down with a short lecture on the limitations of machinery.

"Space travel," he'd said, "calls for judgment on a high level of consciousness. *Good* judgment," he had stressed, cocking a skeptical eye at Mayhan. "No robot ship has ever made a trip like this even in peacetime, when we had every gimmick known to science. How the devil can we hope to do it with a jury-rigged scout? The chances against us would be astronomical in several senses." Meier had added that, as it was, the chances were mighty slim indeed.

Mayhan looked at his typed question again. CAN A HUMAN RECEIVE ONE CHANCE IN ONE BILLION CHANCES OF LIVING THROUGH EVASIVE ACTION VERSUS ENEMY?

Bluntly, the *Pup* had said, NO.

"All right," Mayhan sighed, grinning tightly, "but I've got *some* chance. Even you wouldn't begrudge me that, you pessimist." Mayhan was never quite sure that he'd asked the right question in the right way.

Nor, for that matter, that the autopilot *cum* oracle was always right.

"Let's see," he mused, raising his couch nearer the keyboard. "Given a sudden pandemic attack of scrofula for the Backers—and a cargo of rabbits' feet for Mayhan—I'd still get trounced," he learned.

"Then why did I take on this job to begin with?" he shouted suddenly. The echoes rebounded thinly in the *Pup's* recirculation vents. The *Pink Pup* clicked electronic tongues at him in derision; under the circumstances, she could afford to. Meier had been fairly sure that a Federation scout ship in good condition could, if not encumbered with delicate animal cargo, outmaneuver anything in space. But Meier himself had placed animal limitations on the ship, in the form of Jesse Mayhan. Mayhan swore softly, balling his fists.

A scrap of memory came back to him from his cadet days. "When any action *per se* isn't feasible," the instructor had said, "relax. Save that adrenalin." Mayhan reclined on the couch from long habit, tried to relax. He tried until sweat bejewelled his brow, realized that tension was begetting tension, and guffawed at himself. Then he *did* relax.

For many minutes, only the faint click of relays twittered at the silence. A saffron warning light from the radar console winked once and subsided. No one knew what sort of matter whizzed through hyperspace, but the radar system duly

avoided any possibility of finding out. The *Pink Pup* was nosing nearer to Federation lines every second, spanning light-years with each sweep of the chronometer. Suddenly Mayhan realized that he must be beyond any microwave hookup with Di Cicco. The other ships had been destroyed before they had gone much farther than this. Perhaps he now had a chance.

"Maybe Stine or Vargas or one of the others made it after all," he breathed. "We *could* have got a bollixed signal from them back on Di Cicco." Vargas, Stine and Wright, the last three volunteers, had plotted a steady three-point-five G acceleration course up to velocity limit. Mayhan was holding it down to three, reasoning that he'd be fresher when the real G loads were applied. Mayhan was the best G-loader on Di Cicco and knew his limitations, usually pretending indifference. Now, with the *Pink Pup* as his only company, the feigned carelessness dropped away. He raised himself toward the keyboard again.

ARE YOU NOW OUTSIDE
ENEMY PERIMETER?

YES, was the answer, QUALIFIED.

"That's so," Mayhan conceded. "The information we fed you was pretty arbitrary. Or the Backers could've moved their pickets closer to Vega. But even when you have good news you qualify it." He stared ferociously at the keyboard. "When a female pup grows up, you know

what they call her, don't you," he insinuated. The *Pink Pup* ignored this calumny; Mayhan was moved to further action. GO BLANK YOURSELF, he typed rapidly.

The *Pup* countered primly, INSUFFICIENT DATA.

THEN GO RUST YOURSELF, Mayhan answered, and raised the acceleration to a shade over four G's. He listened with great joy to the confused muttering that went on inside the autopilot's flat crackle-finished face.

The ship was still perplexed and Mayhan still gratified with his small verbal victory when the warning light winked on again. This time it stayed on. Mayhan cleared the autopilot's circuits and asked for specifics. When they came, Mayhan felt sick all over; a ship-sized mass was accelerating past any human tolerance, on collision course and some five minutes away.

The *Pink Pup* slammed ahead as Mayhan sank into his couch, his body in agony. The autopilot's message, now magnified at the base of the main viewscreen, stated that the Backer ship was altering course. The radar was in complete agreement, as usual. Mayhan's sight grew fuzzy; he cut the drive and the engines' vibration shuddered and stopped.

Alertness returned quickly. Mayhan took a deep breath and flicked the ship into normal space. Generators screeched behind the cabin, then there was the familiar gut-churning vertigo and he was alone again.

Mayhan set a new course, trying only to go where the Backers weren't.

After a few minutes' heavy acceleration he cut the drive again. He was trying a random sequence of moves, knowing of nothing better to do.

It was like a game he'd played as a kid, Mayhan decided, usually with all the big kids opposite him. They'd form two parallel chains, arms linked tightly, and the opposition would set up a chant. "Red Rover, Red Rover, let Mayhan come over." Jesse Mayhan had been a scrawny kid, much in demand. The other kids loved seeing him gather speed, running madly toward the human chain. They had the most fun when Mayhan knocked himself senseless without breaking the chain.

For Mayhan, it began to be fun when he learned to sprint at one spot, then hurl his frail bulk at another pair of locked arms that weren't expecting his small assault. Then, he sometimes broke the chain. Once he broke a wrist. It was glorious.

When Mayhan lost, he was added to the opposing side. When he won, he could take the two weak links and add them to his own side. It was the game of Red Rover that earned him his boyhood nickname, Mayhem Mayhan. He was fiercely glad to have such experience behind him, now that real mayhem threatened.

The immediate area around the

Pink Pup was clear of any calculable mass, which was normal. The autopilot was set to reject any jump that would endanger the ship. Mayhan caught himself wondering at the *Pup*'s intellect again as he watched the fore viewscreens. A radar blip sliced his thoughts neatly as it moved toward the center cross hairs at fantastic speed.

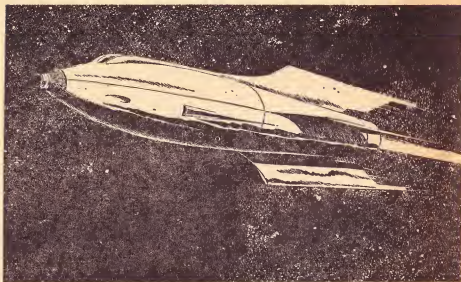
Mayhan reacted instantly; the ship leaped away in a curve that was almost an angle. Another blip came in focus. It was dead center on the cross hairs. From the left, a third blip sneaked onto the screen. Mayhan was boxed.

It took only a second for the jump back into hyperspace. For a screaming instant everything whirlpooled as the autopilot countermand-

ed Mayhan's order. Then the wrenching jump was complete, leaving Mayhan sopping with apprehensive sweat. No time to wonder what had caused the delay; whatever it was, it had thrown him and the Backers far out of contact.

Mayhan checked his position. He wasn't headed for Vega any more, that much was certain. With the data fed to him he set a course change, then committed it. Mayhan was less than one third of the way to Vega.

"So now we know the Backers don't need much time going into hyperspace," Mayhan said, feeding the data to the autopilot in triplicate. Satisfied that the repetitions ruled out the possibility of error, the *Pup* flashed a green eye to show



that she was digesting this new information.

"It's pretty clear," Mayhan continued, "Vargas and the others were clobbered. I could jump back and forth all I wanted, but as long as I'm heading for Vega they can soon pick me up. If I wait, my fuel dribbles away while Backer reinforcements come up.

"So it's up to us," he said, fingering the throttle quadrant. "You and I, *Pup*. We're the last card, the whole card. We're the whole card," he chanted, "the whole chord, the lost chord, the last chord, the last card. Full circle." He shook his head dizzily. "Or almost the last. Maybe we have a last card of our own."

It seemed doubtful. For the first

time in his life, Jesse Mayhan contemplated death. To cease living, to just quit being, was a thought that raged and tore and pounded in him. He controlled his ragged breathing, remembered to relax. His subconscious wasn't having any. Mayhan was poised between quietude and frenzy as he clasped and unclasped the throttle arm.

"O.K., let's talk it over," he croaked. A small crevice in his mind was jeering at him for collapsing under strain. He cleared his throat. "Temporarily we're O.K. But there are at least three Backer ships snooping around nearby. We don't even have one lousy torpedo. I can't outdodge 'em, I can't outrun 'em. The next fix they get on us, we're as good as dead. Ain't that



so?" He almost expected to get an answer.

"So. For all practical purposes I have no chance of outmaneuvering a Backer. But you have, *Pup*. Damn your titanium innards, if this were a simple Red Rover gambit you'd slaughter 'em. Every component in you is pretested for two hundred G's."

Mayhan's fingers hovered over the keyboard while he framed a useless query. "No you don't," he sneered, and withdrew his hands. "That's all you want now, isn't it, to tell me you could do it without me? But you need me, just like I need you, most of the time. When the going gets tough, you'd rather I skedad-dled. Like taking a dive in the capsule, or—"

He snapped his mouth shut and stared at the screens. A Backer ship was coming up fast behind him, preparing its favorite trick of cutting in the fore jets and slowing down at fifty G's while incinerating its enemy. Very economical, thought Mayhan. But the trick in Red Rover is in not being where you're supposed to be, at the critical time. "And I figured it out without you," he told the ship archly. "Meier was right, right down the line."

He crouched over the keyboard as far as his harness would allow, then set the steering jets for a tight clockwise turn. He left the ship at that setting and began feeding instructions to the *Pup* while the Backer ship, its radar obviously locked

onto the *Pink Pup*'s mass, howled in pursuit.

Mayhan saw that the Backers couldn't turn inside him, since the momentum change wasn't a straight linear type. If they could, a quick kill would have been easy. As it was, momentum tugged mightily at Mayhan, trying to wrench him from his one-handed grasp on the keyboard as he pecked, as if with aged palsy, at the keys with one finger. His sight was growing bleary. That's an early sign, he thought. The G-meter showed a trifle over six gravities, enough to black him out in just under five minutes. With a final lunge he struck the MESSAGE ENDS key and relaxed—too completely. He was thrown against the edge of his couch with a jarring smash.

A newly formed wrinkle in his all-purpose suit cut into Mayhan's back as he wriggled into position in the contoured couch. His vision was dimming, but still good enough for watching viewscreens.

This is a one-shot proposition, he thought dimly. Gotta be able to hit that EXECUTE key. Mayhan fought against the drowsiness and nausea imposed by minutes of bone-grinding acceleration. He had to wait until the Red Rover chain was complete.

Mayhan was fuzzily aware that if he blacked out completely, his suit would relay that information to the *Pink Pup*. Then the ship would stop its steering jets, the mad merry-go-round would stop—and the *Pup* would be atomized a moment later.

He couldn't afford to let that happen, and refused to wonder why the Backers hadn't sent out a homing missile. Full realization that the Backers were only toying with him might have snapped Mayhan's reason.

It wasn't clear any more just why, but for some reason he had to stick with it.

A new blip came racing into the right-hand viewscreen, then, and Mayhan was instantly wide awake. He clawed frantically at the keyboard and shut his eyes, feeling his jaws creak in a spastic gritting of teeth.

What am I doing, he thought. I can't see the screens. He pried his eyes open and saw the second Backer ship accompanied by a third, coming in to make a neat kill. Mayhan stabbed down on the EXECUTE key, then dodged back into his couch as one hand groped for the *auf Wiedersehen* handle.

The *auf Wiedersehen* handle was, as it had always been, the pilot's best friend. No one in the Terran Federation fleet knew the exact origin of the name, but the facts spoke for themselves: when all else failed, pull the little handle—and *auf Wiedersehen*.

Q. E. D.

Mayhan, tissue-paper limp, was hauled tightly into his couch by his harness webbing. The couch flipped smartly backward and became half of a cylinder with Mayhan inside. He never felt the jolt

that catapulted the escape capsule away from the *Pink Pup*.

The Backer ships paid no attention to the tiny mass that drifted away at a tangent to their quarry's course. They were used to it. Supercargo, chunks of the ship itself or even escape capsules were of little importance. The ship was the thing; without it, and with no hope of friendly rescue, escape capsules were only a method of prolonging the occupant's death. Later, the Backers might cruise around to collect samples of jetsam. The aliens had no doubt of their ability to stay with the quarry; they were all locked onto the target, which suited Mayhan just dandy.

Mayhan groggily moved a hand to massage his aching neck, slightly amazed to find himself in working condition. The capsule gave no illusion of movement; its tiny jets were silent. Outside somewhere, he knew that the *Pink Pup* was having her fling at a singular game of Red Rover.

At first he could see no sign of action in the void beyond him. Then, peering back through a porthole, he saw an incandescent flash light the other-dimensional heavens. Mayhan knew that a ship had died. He knew somehow that the *Pup* was still, spectacularly, alive.

Gleefully he reviewed his instructions to the *Pup's* autopilot. EXECUTE RANDOM CHANGE OF COURSE, he had typed. CONTINUE CHANGE OF COURSE FOR TEN SECONDS. EXECUTE

CHANGE OF COURSE EXACTLY
OPPOSING ORIGINAL CHANGE
OF COURSE AFTER TEN SEC-
OND INTERVAL. CONTINUE
SAME OPPOSING CHANGES OF
COURSE AT TEN-SECOND IN-
TERVALS UNTIL YOU ARE NO
LONGER PURSUED, WHEN NO
LONGER PURSUED, PARALLEL
COURSE AND VELOCITY OF
EMERGENCY PILOT'S RADIO
SIGNAL SOURCE. DELAY ORIG-
INAL EXECUTION THREE SEC-
ONDS AFTER EXECUTION OR-
DER. EXECUTE ALL CHANGES
OF COURSE AT ONE HUNDRED
FIFTY GRAVITIES. MESSAGE
ENDS.

Mayhan stopped laughing in mid-chuckle. "Random course change? *Random*? The *Pup* could've bashed into my capsule!" He giggled a little madly. "Well, obviously she didn't." A wink of flame caught his eye, a fiery line scrawled far ahead of the capsule. It was trailed by another flame. Then, like flashlight beams bent, they came nearer.

"Eight thousand, nine thousand, ten thousand," Mayhan muttered; then the flame bent again. The following ship tried an identical course change.

Fortunately. Mayhan grunted in satisfaction as the trailing flame was extinguished. He set his emergency radio on continuous call; he waited.

"We did it, ole dog," he hummed softly. "We broke the chain, we wrecked 'em, faked 'em out. We—" he watched a pinpoint of light as

it became a thin line curving toward him. "Great space!"

Belatedly, Mayhan realized the implications of the orders he'd given the *Pup*. Execute all course changes at a hundred and fifty G's, he'd said. The *Pup* took him at his word.

In one instant, the flame passed behind his field of vision. In the next he was wildly urging the capsule's engines into action. He hadn't said how closely the ship should parallel his capsule, and suddenly understood what Colonel Meier had meant about good judgment. He could still become a cinder in God's eye with the *Pink Pup* decelerating so hard. The fore jets would be lancing a tongue of flame several miles ahead of the ship itself, and if the *Pup* elected to come in close—well, that was the stuff of which posthumous medals are made. Like a small boy urging his rocking horse on, Mayhan lunged against his harness. He had a mental picture of a barrel-sized gun muzzle aimed at the base of his skull.

The capsule was scarcely under gentle acceleration when a ravening light rebounded from the capsule's padded inner lining, blinding Mayhan for the moment. When his eyes refocused, the *Pink Pup* was making short spurts first with aft jets, then with fore jets, trying to keep pace with the capsule while making all course corrections at the stipulated hundred and fifty G's. Mayhan quickly shut off the capsule's power

plant and the *Pink Pup* sidled up some quarter mile away.

Mayhan's eyes misted, though it could have been from the terrible glare of a moment before. Thoughtfully, he prepared his G-suit for deep space conditions and, feeling the suit linings expand, he jettisoned himself from the capsule. It took only a moment to detach the capsule power plant from its linkages. Then he steered himself with several miscalculations to the ship's air lock.

"One'll get you five," he said acidly as he crawled through the air lock, "if I'd steered the capsule closer you'd have shied away. I'm taking no chances."

Mayhan emerged into the cabin to find his equipment in some disorder. An errant chewing gum wrapper was firmly plastered to the aluminum air-lock frame. Mayhan had to scrape it off. One of the atmospheric pressure gauges had lost a pointer, which had burst from its glass cage and skewered a bulkhead.

Mayhan worked it loose, eventually. Every boxed component in sight seemed to sag tiredly; it appeared that everything was tested for two hundred G's but the shock mounts. Mayhan made a note of that one.

There were reams of notes to be taken but Mayhan busied himself with more pressing matters. "We won this 'un, *Pup*," he crooned, "and we're gonna keep going according to the rules."

A Vegan battle cruiser was the first to pick up Mayhan's IFF signal. It was a tribute to Federation Planning Center that an Identification, Friend-or-Foe system was in effect before the Backers brought the need of it; but jumpy Vegans weren't inclined to trust a signal coming from Backer areas.

Three ships were approaching, the IFF signal coming from the leader of the closely-spaced trio. They were obviously Backer ships, reasoned Intelligence officers, since no one but Backers could be approaching from Backer lines. They found that they were only sixty-six per cent correct.

"All right," a nervous Terran captain found himself saying, some minutes later. "If you're who you say you are, how the devil did you manage to put two Backer ships in tow?"

Mayhan sighed gently, gesturing into the screen. "Going by the rules of the game, captain," he said. "I broke the chain, so I was naturally entitled to choose a pair."

The captain ran a hand across haunted eyes at the word, "naturally." "You must realize that we can blast you down at any time, lieutenant . . . if you are a lieutenant."

"But that wouldn't be quite fair, sir," Mayhan grinned. "We won."

The captain craned his neck into the screen as if to look around the edge of it. "We?"

"The *Pink Pup* and I," Mayhan explained maddeningly. "Our prizes may not be what you'd call the neatest in space, being decorated

inside with eight-legged lumps of goo. But they're all ours," he chorled.

"You've got that mighty right," the captain growled. "These are the first enemy ships we've captured intact."

"Not quite intact, captain. These ships aren't built like mine is; their autopilots are torn half to pieces. I even had to crowd 'em up close to jump back out of hyperspace with 'em."

"That remains to be seen. You just keep your hands where I can see 'em, lieutenant. You're giving us the jitters."

"True," Mayhan admitted, "if interesting." He went on, more reasonably. "Captain, the only undesirable cargo I'm carrying is a bunch of Backers that couldn't take it. They were locked onto my ship, twiddling their tentacles in the happy thought that they could take any maneuver I could. I guess it never occurred to 'em that I might send in my autopilot for a substitute."

The unhappy captain turned away for a moment, conferring *sotto voce* with someone out of the screen's range. Mayhan waited, keeping his hands conspicuously before him.

"Your claims are partly true, at least," the captain said at last. "Our

records show that there is a Lieutenant Jesse Mayhan on Di Cicco."

"Was," Mayhan corrected. "I'm here, now. And pretty tired. I left my couch back in hyperspace and I've been standing up most of the time since, under acceleration." He assumed his best haggard expression. "Me for a nice, soft bed."

There was another hurried consultation. Finally the captain shrugged into the screen. "My guess is that you're clean. Nobody—but *nobody*—could imitate a scatter-brained scout pilot this well. Stand by for a boarding party."

"You bet," Mayhan replied. "And captain, would you do me a favor?"

"What is it?"

"Roust out a tech to etch off the sign I put on my ship's nose."

"I suppose I can. You're one of those mental pygmies who names his gadgets, are you? Finally come to your senses?"

"In a way," Mayhan idly stroked the autopilot keyboard. I don't want to call her *Pink Pup* any more."

"Believe me, I'm grateful," said the intelligence officer dryly.

"No," Mayhan continued, "she grew up on this trip. Reached the age of reason, you might say. From now on, I'm calling her the *Red Rover*."



THE DEVIL, YOU SAY?

Sometimes a Contact specialist can have a lot of trouble, through absolutely no fault of his own. . . .

BY WALTER L. KLEINE

Illustrated by Freas

The Final Preliminary Survey Report said that the planet was within limits for comfortable habitation, and that the culture was worth developing. It took about fourteen hundred pages to say so, but why worry about details?

I handed the last section—about fifty pages on the local fusion bomb—back to Coryn, along with the half-page of notes I'd scribbled while I read. She took them with something like relief and headed for the Data Room, where something like half a dozen men were sitting on their tails waiting to transfer the details to microtape for the official record and to make a digest of it for practical use.

THE DEVIL, YOU SAY?



I looked up at the assembled brass and brought my tail up and scratched behind my right horn—the one I'd injured diving into an air lock at the conclusion of an unusually hasty return to said air lock, some years back.

The captain, an Alincikntian whose name I can't pronounce, much less remember, said: "Well, Serrin; what does it look like?" He had an accent that could have been distilled and bottled.

I enjoy these moments. My only regret is that there is only one to a planet. Exploration Regulations state that the Daredevil—or Initial Culture Contact Specialist, if you prefer the official title—has the power to refuse to permit an actual landing on *any* uncontacted planet, except in cases of the most violent emergency. The actual order to land still has to come from the big brass, but if the Daredevil says "no," they don't have to worry about the decision. The theory is that if a Daredevil refuses to land on a planet, there is either a very good reason for it, or he is no longer a Daredevil, in which case there wouldn't be much point in landing him anyway.

I've never heard of a Daredevil refusing, but the brass always manages to work up a sweat about it.

I waited until I was satisfied I'd gotten the effect I wanted, then leaned forward and pursed my lips. They leaned forward too, almost as if I'd pulled them on strings. After a suitable pause, I looked up, smiling. "Looks good to me," I said.

Their relief was audible; almost. Since they weren't officially worried, they couldn't let it be known that they were relieved. It was most satisfying.

"What's your recommendation for a landing site?" the captain asked, as if nothing had happened. He lost about a third of his accent when he relaxed.

I could have given him a straight answer and had it over with and gotten some sleep, but I didn't. It was just possible that I would have to yell for help before this was over, and I wanted to be sure the brass would have some appreciation of what I was talking about if I did. They didn't have time to read more than a few pages worth of the final digest. And then, too, it *is* fun to keep this much brass packed into one little room for about three or four hours . . .

"Well," I began, "the locals appear to be bi-pedal, tailless, hornless, and at least bi- and probably multi-racial. They also appear to be multi-cultural, multi-lingual, and multi-governmental . . ." I droned on, letting them go to sleep on the minor stuff and making sure they were awake when I had something important. There was plenty of the latter, this time. Any planet at this stage was almost bound to give trouble. The differences between different local groups often gave more trouble than the differences between any given local group and ourselves. This planet was worse than most, and there was one factor

not common to this or any other type of planet: we couldn't get an ungarbled signal from either their voice or visual transmission equipment. It shouldn't give us any trouble after we got under their atmosphere, but you never *knew*. There weren't many records on this type of problem.

When I got through enumerating the possible problems of a planet with civilizations ranging from Late Stone Age to Early Post-Fusion, I punched a few buttons with my tail and got a map first of the medium-sized continent that seemed to have the highest technical civilization. I pointed out a few of the important features and went down through several smaller detail maps until I had one of the area where I wanted to land. It was in a large plains area, between a large river that almost cut the continent in half and a massive mountain range that covered most of the western end.

My main reason for picking it was because we could land between two well-separated towns, but not far from a main highway and not *too* far from a large military air base. We shouldn't have too much trouble making contact with them, and if they were unhappy about it and tried to use a fusion bomb on us, they couldn't do themselves much damage.

When I had finished explaining everything, I said: "If you give the area a thorough study, I'm sure you'll come to the same conclusions. Any questions?"

There weren't, of course. The captain spoke for the group—just in case one of the new officers hadn't gotten *The Word*. "No," he said slowly, "I don't believe I have. You want to land at the usual time, of course?"

"Of course."

He looked at his watch. "Your ILC will be ready for launching at 26:00 hours, ship time. That will get you down at their dawn. Can your crew be ready by then?"

"Yes, sir," I said. I rose and saluted them, not because it was required—Daredevils don't have to salute anybody—but because I enjoy watching that much brass trying to return a salute in that small an area.

They struggled through the salute return and left. I kept my laughter silent. *What* is it that makes a Space Officer—especially one with forty-three planet contacts behind him—refer to a spear, which has a length-diameter ratio of 22:1, as an ILC? If he were trying to be very official and accurate, he would call it an Initial Landing Craft, which would not take much longer to say than "Eye-El-Sec."

I permitted myself an audible laugh after the door closed, and then called Crew Personnel. I told the clerk who answered: "Serrin speaking. Will you locate my spear throwers and tell them we get tossed at 26:00? I want them to have some sleep."

She said: "Yes, sir. Shall I call you when I have located them?"

"Don't bother, unless you can't find them."

"Yes, sir." She switched off, looking slightly puzzled.

I grinned and called Rak, Tak, Lak, and Zak, my Uaklatidlian Artifact Examination and Interpretation team. They were quadruplets, and Uaklatidlians have brood telepathy, so each could use any of the information possessed by any of the others, without recourse to the computers in the mother ship. Each of them had specialized in a different complex of areas, and the four of them could handle virtually anything that turned up in any civilization. They were better than average at it, too; I'd been lucky to get them.

Lak answered. He looked awfully sleepy. I said: "Hi, Lak; thought I'd let you know we get tossed at 26:00, in case you want to get some sleep before the momentous moment."

He yawned. "Yeah. And what else is there to do in this tub?"

"Well," I said, "you can always flirt with the girls." Uaklatidlians are asexual.

He grinned. "You are right, as usual. Tell Coryn I love her madly." He switched off. For a bird-evolution product, he had a remarkably humanoid sense of humor. Maybe that's why Uaklatidlians are officially classified as humanoids.

I shut down the desk and walked over to the Data Room.

Classification and Assignment has a habit of taking pretty good care of Daredevils, but they outdid them-

selves when they assigned Coryn to my crew. She is not only one of the best Communications Analysts I've ever run into, but she is also about the cutest thing under horns. She even has the ability to look sexy—without looking like she was trying to—in the form-fitting Regulation Spacecrew Uniform; that archaic and ugly, if functional, hangover from the days when spacecrews still had to be ready to make a dive for their spacesuits with no advance notice.

I'm not sure just what it is about her that makes her that way—maybe it's the unusually deep and even redness of her skin—but I do know that whatever it is, it makes her quite a girl.

She was wearing headphones and had her face buried in a 'scope when I walked into her cubbyhole. Probably, she was trying to find the relationship between a voice and a visual transmission. She'd been having a miserable time with the garbled stuff they'd been getting for her.

I ran the point of my tail up and down her backbone. She didn't even twitch. She said: "Hi, Serrin. This is really a mess. I wish I could see the inside of one of their receivers or transmitters. Might get somewhere, then. I'll be with you in a minute. Don't go away."

Spear-tossing is supposed to be terribly exciting. It isn't.

Spears weren't designed to handle easily. They were made very long so they could get an antenna-complex

as far off the ground as possible—most of the length is just a housing for a three-section extension mast. The fins have to be wide to provide a stable base for all that height, and the control drives have to be mounted at the end of the fins. In an atmosphere, a spear is terribly sensitive, and almost as awkward to handle.

It isn't exciting. It's just hard work, like most allegedly glamorous jobs.

We had a comparatively nice ride down, until we hit a thunderstorm a few minutes above the surface. It was only a few minutes, but I was wringing wet by the time I got the fins firmly planted in the local real estate.

I flipped the intercom: "We are here. Everybody intact?"

I got a chain of affirmatives and flipped off the intercom and got out a towel. When I was reasonably dry I went forward and helped Coryn and one of the spear-throwers secure the front end and rig out the antenna complex.

By the time we were finished, the other spear-throwers had secured the rest of the ship and Rak, Tak, Lak, and Zak had finished the preliminary surface work.

When we entered the Data Room Zak looked up, which meant he was the least busy of the four. He said: "The place looks clean and perfect. You may go forth and fraternize, and you won't even need an umbrella. The rain stopped a few minutes ago."

"What could you expect?" Coryn asked him. "These planets know better than to rain on Serrin."

I laughed and asked: "Any sign of the locals?"

Zak nodded. "Plane came over a few minutes ago, just as the rain was beginning to clear up. Looked like a twin-engine passenger job, flying low to get under the storm. Looked perfectly ordinary. He passed to the south, apparently saw us, and came up and made a fast circle. I mean fast. The way he was banked over, you'd think he was a fighter of some kind. When he finished the circle he came right down on the deck and really poured on the coal—almost half the local speed of sound. I've never heard of anything quite like it. These boys must have prop and piston-engine design down to the finest of arts. I've *never* heard of anything quite like it!"

I groaned silently. This was a rotten way to start off—the first thing we find is atypical. They all knew it. I said only: "This could be a rough one, couldn't it?"

They nodded. I said: "Well, I shall go dress to receive callers, if any. If that nearest farmhouse does not house too atypical a farmer, we will be hearing from him soon. Keep me posted."

I went back to my cabin and swapped my uniform for the gimmicked one I wore for contact purposes. It was woven around the wiring for a small force-field—they used to lose a lot of Daredevils be-

fore they figured this one out—and it also concealed a two-way communications set, which included a sensitive omnidirectional mike and transmission camera. The only bug in it was the necessity of keeping the force-field and communications antennae separate. I had to wear a heavy and unwieldy cape to provide that separation.

I snapped the cape into place, picked up a handful of sample cases, and went out the air lock.

The local air was still pretty damp from the storm, but it had a fresh, clean smell to it that didn't seem like it was entirely the result of having just been washed.

We seemed to have landed in the middle of a very large grain field, in gently rolling country. I took a sample of the grain, which was still quite young, and pawed around the area for other things associated with it. I found the usual, except that there seemed to be less of most of it. I hadn't been out very long before Rak called and announced company.

"Looks like our farmer," he said, "and he doesn't look happy. He's carrying a gun of some kind. It's long and double-barreled. I can't see the inside of the bore, but it looks big."

"Offensive or defensive?" I asked. Offensive force must always be noticed and matched.

"Can't tell. Looks like it might be both."

"I'll assume defensive until proven otherwise. What does he

look like?" I had put down my sample cases and was heading in the farmer's direction.

"Stocky build; well muscled; light skin; kind of a coppery-tan shade. Looks middle-aged; has lines on his face. He has head hair; black, stippled with white. Clothes are two-section; light-blue above and dark-blue below. Hat is wide-brimmed and kind of floppy; looks like woven dried grass of some kind. Shoes and belt are some kind of hide; shoes are ankle height. That gun looks well taken care of. I'm glad he's your worry and not mine."

A few minutes later I was wishing he wasn't my worry, either. He *did* look *very* unhappy. He didn't see me for a few seconds—his eyes were on the ground—and I had a chance to get a good look at him. Then he saw me and stopped in his tracks, with his mouth open. He was really surprised, which was not too unusual, since there were some very marked differences between him and myself. Differences just as great existed on his own planet, though. I used his hesitation to close the distance between us. I wanted him to be able to see plainly that I carried nothing that looked like a weapon, whether his own was intended for offense or defense.

He recovered abruptly when I got close to him. He said something that was just noise to me, in a deep, husky voice. It sounded like it might be a greeting of some kind, so I responded with the Universal Ritual of Peaceful Intent, which had been

carefully worked out to be as soothing and reassuring as possible in situations where neither language nor signs were mutually known. I slipped my wrists through loops provided in the cape and stretched out my arms, raising them slightly above shoulder level, so that he could see that the cape concealed nothing that looked like his idea of a weapon. Then I began the appropriate speech, pitching my voice as low as possible to match his.

I got through the first few words before he came to life like an uncoiling spring. He brought his weapon to his shoulder and fired—both barrels, I found out later. Even with the force-field around me, I felt like somebody had landed a spear on my chest. It didn't knock me down, but I think it moved me back several feet. I was too groggy to be able to think for a minute, so like a fool I stood there and scared him half to death by not falling over, as he had every right to expect. By the time I was thinking again, he had dropped his weapon and run.

I swore silently and salvaged what I could of the encounter by picking up the weapon and a handful of the pellets it fired, and taking them back to the spear with the other samples I'd gathered.

When I was almost there, Lak called me and said: "Better hurry it up. We've got more company. Three very military-looking jets coming in on the deck. Must have come from that air base down to the southeast." As an afterthought, he



then added: "Friendly people, huh?"

I said: "Yeah," and started running. I made the air lock in plenty of time. I left the air lock open on the outside, for the sake of appearances. Inside, everything was buttoned up.

I reached the Data Room just in time to watch them land. They were single-jet, swept-wing jobs, traveling just under the local speed of sound, in an unusually tight triangle. Just before they reached us, the lead ship pulled up in a steep climb, barely missing the top of our antennae. The other two banked sharply in opposite directions and went past us in shallow, climbing turns, one on each side of us.

"Camera ships," said Zak, "I guess they're just curious."

The ships turned sharply and made an identical pass from the opposite direction. They made no effort to re-form their formation until they were well away from us.

"I think we can assume that those ships are not too far from the best available here," said Zak, "and they were probably traveling at their limit. They're nothing special as jets, unless we find out that they shouldn't be this good this early. Nothing wrong with those pilots, though."

I took a couple of steps toward the hatch, to go out and look around some more when Zak's voice stopped me. "Take a look at this!" he said.

I looked. There was an image of an airplane in his screen. I went over

and looked more closely. It was a monster.

It had ten engines—six pusher prop engines and four jets in pods out at the wingtips. Every one of them was operating.

"It came in off the mountains," Zak explained, "and it's about five per cent higher than it has any right to be, and it's doing about two thirds of the speed of sound at that altitude. Those wings are about as long as this spear. Armed to the teeth, too. And look at the size of those bomb bays. I can't even remember *reading* about anything like it!"

I said: "Yeah." I'd seen big airplanes before, but nothing quite like that. That thing was a flying battleship. "How long before it gets here?" I asked.

"Not over half an hour, at that rate," said Zak.

I decided to wait until I knew what it was going to do before I went out again. I tried to help Coryn with the communications problem while I waited, but I accomplished even less than she, which was approximately nothing. She kept muttering things about "incompatible primitive signal transmission," which, while it accomplished little else, did prove that, although female, she had been in space long enough to do a respectable job of swearing like a spaceman.

I learned how to say what the farmer had said to me, but that was all. We had no idea what it meant, although it seemed like it might be some form of greeting.

Shortly before the monster reached us, we had more company on the ground. A car came out the nearest road and parked as close to us as it could get. It carried a man and a woman, who got out and started walking toward the spear. They were about the same age as the farmer, but both were noticeably lighter-skinned. Office-workers, probably. Their clothing seemed to confirm this; it was much neater and had a less substantial appearance. The man carried a film camera and the woman had a manual notebook.

They might be government officials, news people, or one of each. I decided to let them walk until I was sure what that monster was going to do.

The monster didn't do anything. It came up to us and started circling. Rak measured its orbit and did some figuring and said: "All he has to do is make a ninety-degree turn out of that circle and open his bomb bay and he can lay an egg right on top of us. We're bottled."

"Smart boys," I said. Their fusion bombs couldn't hurt us through our force-field, but if we were trying to take off and didn't have our force-field firmly anchored in the local real estate, the impact of even a small fission blast would knock us end over end, out of control, and a force-field was no protection against the impact of a crash.

I waited until I was sure that the monster wasn't planning on laying an egg on us immediately, and until our two visitors were almost to the

spear, before I snapped on my cape and went out to met them.

Unlike the farmer, they saw me as soon as I saw them. The man was pointing at me when I came out the air lock. They paused, seemed to be discussing something, and then the man brought his camera up to face level and apparently took a picture of me and the spear. It took him a long time to change the film—apparently the camera had a manual magazine.

They stopped again when they got close enough for me to begin to make out the details of their clothing and faces. The man said something that was too low for me to catch. He seemed to want to go back. The woman said something in a louder, more positive voice. The man made a gesture and followed her for a few more steps, then stopped and took another picture.

As the woman approached, I went through the Universal Ritual of Peaceful intent. It didn't seem to have any effect on her. Her face might as well have been carved in stone. The only result of the Universal Ritual was that the man suddenly acquired a remarkable speed in changing the film in his camera. He was taking pictures as fast as he could.

Since the Universal Ritual had flopped twice, now, I started through some of the less universal rituals. When she got close enough, I tried the one where each party extends the left hand, clasps the other at the

waist, and leans forward to touch left ears. The symbolism is usually: "What passes through your body and mind passes also through mine."

She shifted her notebook to her right hand and extended her left, and for a second I thought I'd finally found the right ritual. But instead of clasping my waist, she slapped my extended hand—hard. Apparently what passed through mind and body did not also pass through hers. I decided to let her make the next move, since she seemed to be so perfectly sure of herself. I was beginning to wonder if we could possibly have a matriarchy on our hands.

She shifted her notebook back to her left hand and started talking, accompanying her words with rapid gestures of her right hand, which was made into a fist, except for the index finger, which was extended rigidly. The pattern of gesture was roughly circular, with the center just below my nose. None of the gestures meant anything to me, and I was able to take a somewhat perverse pleasure in the fact that she must now be experiencing some of the frustration that I felt.

Whatever she felt, it didn't show in her face or in the tone of her voice. It was hard to identify any similarity in her words and those of the farmer, because her voice was so much more high-pitched than his. I was able to pick out an occasional familiar sound, however, and there seemed to be a definite similarity between what he had said and the first sounds she made.

I couldn't tell with any certainty whether she was angry, happy, or somewhere in between. She looked and sounded unhappy, but the criteria for these things vary from one planet to another, and it may have been something she couldn't help, anyway. Her voice had an unpleasant overtone that reminded me more than vaguely of an unhappy buzz saw, and her face was a mass of hard, angular lines that couldn't have been deliberately designed to produce less beauty.

She talked for a long time, then seemed to realize that she wasn't getting through to me. She paused, as if expecting me to say something, and I tried a few more rituals without visible effect. She turned her head and said something to the man, then turned back to me, actually smiling. She said something that sounded very similar to what the farmer had said, and I thought for a split second that maybe I was about to get somewhere. But then she slapped me, using her right hand. There was nothing gentle or friendly about it, and fortunately I saw it coming in time to duck far enough to save her from breaking her hand against the force-field.

She turned and started walking rapidly away, so since all other possibilities of accomplishing anything seemed to be gone, I tried saying what the farmer had said. It was not recommended Safe Standard Procedure, but there are times when it is better to take a wild stab than to take no stab at all. I tried hard

to get all the inflections placed right, and it came out: "W-wy donchoo go to hell?"

It had an effect, but not what I wanted. They both froze, turned and looked at me with their mouths open, then unfroze and started running.

I gave up and went back to the spear.

I spent the rest of the day grubbing around for local life forms. I didn't find anything helpful. Insects, bacteria, weeds, a small snake, two birds, et cetera—all of it important enough in its own right, but essentially useless until we cracked the very basic problem of communication. It looked like we were going to have to first solve the problem of the local method of communication transmission. It seemed to be totally incompatible with our equipment.

The locals didn't make any more attempts to contact us directly, and it didn't make me unhappy. The book wasn't applying very well here, and we weren't likely to get very far until we wrote a few new chapters.

The monster bomber continued to circle overhead until shortly after noon, when another identical monster replaced it. I guessed that the first one might have been on a training flight, with empty bomb bays, and the second one probably was loaded.

Late in the afternoon, a large ground force was flown in and parachuted into positions, drawing a large circle around us at about half

the distance to the towns. The operation was performed with remarkable skill, speed, and co-ordination. The accent was on extreme mobility and heavy individual fire-power. Their vehicles ranged from small, open trucks to rather large tracked, armored mobile gun platforms. They had a lot of light-weight artillery that seemed to be gimmicked in some way to get around the recoil problem, and maybe two or three times as many light-weight portable powder-rocket launchers. Every man also carried some form of hand weapon, many of which appeared to be automatic.

They were ready for trouble, but didn't seem to be looking for it. They evacuated both the towns and all the farmhouses, and managed to do it with considerable speed, though not without confusion. They seemed as anxious to keep other people from reaching us as they did to keep us from reaching other people.

Just before dusk, they flew in another batch of men and equipment, which they set up as mobile reserves, well behind the main perimeter.

About that time, Coryn gave up trying to crack the language on what we had. She and Rak, Tak, Lak, and Zak had spent most of the day working alternately on the local signal transmission and what the farmer and the woman had said. They couldn't get a signal that was ungarbled enough to be useful, and there wasn't enough of the woman's speech to give them anything they could relate to anything else. They

made some progress, but not enough.

"We have *got* to see the insides of one of their receivers," she told me when I came in for the last time. "They're using some off-breed transmission system or other, and our equipment won't handle it. The other stuff just isn't enough. You'll have to go out and blunder around a lot more, or get me one of their receivers!"

It wasn't one of the things which the book looked upon with much kindness, but it was better than blundering around trying to make personal contact with locals who didn't conform to the book. I said: "O.K. We'll go into town later in the night, when they may not be so alert. We'll take a pole and keep down on the deck and hope their detection equipment is still primitive enough to let us through. Now let's get some sleep. If we find what we're looking for, we may not get much for a while."

A "pole" is almost just exactly that. It's a rather long plastic tube with an antigrav polarizing unit on each end. The tube carries a small force-field generator, a couple of saddle seats, controls, and a folding cargo platform. It isn't very fast or maneuverable, but it can be easily dissembled and takes up very little storage space. Above all, it weighs next to nothing.

We slipped out the air lock and headed for town shortly before local solar midnight. Coryn and I rode

one pole—neither of us knew enough about the other's business to do the job right. Lak followed us on another. Rak, Tak, Lak, and Zak wanted to look for some other assorted artifacts, and thought they knew where to look. It was taking a real chance to let one of them come out and look around the place, but we did need the information in the worst sort of way. Anyway, we'd already thrown the book so far away that a little farther shouldn't have much more effect.

We wore black and showed no lights and wore night-glasses. We stayed right down on the deck and took it easy. We had all night, after all.

We didn't have any trouble getting into town. We already knew about where the locals had their troops posted, and it wasn't hard to slip between them.

We had to be more careful in the town. The locals were patrolling the streets pretty heavily and seemed to be using a lot of the buildings for temporary headquarters. The patrols all included at least one man with a rocket-launcher.

We split up before we went in—the buildings Lak wanted to look over were at the other end of town, while ours were near the center.

Coryn and I stuck close to the rooftops and double-checked for patrols before we crossed any open space, and we got in without any trouble. The first hitch came when we got to the building, which we had selected in advance because it

had more antennae coming out of it than any other in town.

The locals were using the building for a temporary headquarters of some kind. They'd put something over the windows to keep the light from showing, and we didn't see it until I was almost ready to remove one of them. It *was* the building we were looking for, though. There was a big sign in front with some lettering and a common electricity symbol—stylized lighting—centered around what could only be a line-drawing of a communication receiver. It looked like a picture reception job, but it didn't bear too much resemblance to the usual types.

Coryn said quickly: "Let's try the rear. Almost all the antennae come out of that part anyway. It's probably the repair shop, and they might not want to bother cleaning it out when there's so much other space available."

I said: "O.K.," and eased the pole along the side of the building until we found a window that hadn't been covered.

Coryn looked in and said, with carefully suppressed excitement: "This is it, Serrin; this is *really* it! They've got receivers and test equipment all over the place! Do you think we could get in there for ten or fifteen minutes? I don't think they'd hear us up front, if we were careful. They're making too much noise of their own."

I wasn't so sure, but I decided to take the chance. It seemed less of one than looking for another place

like this, which, after all, might also have been taken over by the local military. I said: "O.K. Let's try the next window. It's farther from the door into the front part." I checked the roof, which was flat and slightly below the top of the walls, and then dropped down and removed the window and eased the pole through it.

Coryn went wild.

We didn't take any chance of getting one that was in here for repairs. We found a corner of the room that was devoted to storage of new stock, and selected one and opened the shipping carton to make sure we had what we were looking for. It didn't take long. We rigged out the cargo platform on the pole and tied it down.

The next step was to find out what kind of juice it ran on. Coryn found a set that was plugged into the wall and unplugged it and plugged her tester into the socket. She barely strangled a gasp. Then she said: "Here it is, Serrin. This is why we couldn't get an ungarbled signal."

"Why?" I asked.

"These jokers use *alternating* current!"

It was my turn to choke off a gasp. "But I thought that the only people who used A.C. were civilizations that had just started using electricity and hadn't worked out a local equivalent of the Snchofflyn Equations."

"It says so in the book. These



boys have written a new chapter. They must have missed the Snchoflyn Equations and worked with A.C. until they got it stuck in their heads that there was no way to transmit D.C. over long distances economically. It's possible to do some wonderful things with A.C., at least in a lab. These boys seem to have taken it out of the lab. Boy, are we going to have a job unscrambling this mess." She spread her arms to include everything in the shop. "It's no wonder we can't unscramble their signals. If they use A.C. their whole transmission theory must be different—even if they change the stuff back to D.C. inside of the set. We'd better take a couple of their antennae back, too. Ours may not be tuned right for their signals."

We hunted until we found one each of the two basic types of antennae we'd seen on the roof, and added them to the load. We found a couple of spools of lead-in wire and took that along, too.

We poked around a little longer, and Coryn added a few handfuls of parts and a couple of test instruments and some tech manuals. I found four newspapers, three technical magazines, a picture news magazine, a girl picture magazine, and a calendar mounted on the lower fifth of a large piece of cardboard with a large picture of a nude girl and some lettering on the other four fifths. The girls weren't bad looking at all, if you made some allowance for their light pigmentation and lack of horns and a tail.

The pole bowed slightly under the weight as we lifted off the floor, but not enough to matter. Weight isn't a limiting factor in a pole's performance. We almost didn't get the load through the window, though. We had to turn off the force-field to avoid taking the wall with us.

I eased up the side of the wall and over it and down onto the flat roof. I wanted to be extra sure that no one was looking in our direction when we started back.

Coryn said: "Oh-oh. Look. Behind us."

I looked.

The local moon was coming up. I stared at it and swore under my breath. I should have thought to check on that before we went charging out like this. It wasn't really very bright, but I felt as if somebody had turned on a searchlight.

Then, as I stared at it, as if staring would do any good, a black silhouette floated slowly across its face. The silhouette of Lak and his pole. He was doing just what I had told him to—staying right down on the rooftops. Only the trouble was, the moon was right at roof-top level, too.

I turned up the gain on my suit-mike and whispered savagely: "Lak!" but I was about two seconds too late.

There was a small explosion a few streets away and a flare arced up into the sky. It might as well have been daylight. A dozen others followed from all over town.

Lak kept his head and did the only logical thing. He stood the pole on end and went straight up. Gravity is not a limiting factor in a pole's performance, so they can go straight up as fast as they can go in level flight. It still wasn't as fast as the local's powder rockets. Launchers and automatic weapons went into action all over town, and the sky was full of rocket trails. I counted thirteen hits on his force-field before he vanished into the darkness above the light of the flares. The locals were good with those launchers.

He kept on going up, and leveled out well above the probable range of any local antiaircraft guns. He got back to the spear just ahead of a flight of supersonic jet interceptors.

Coryn and I stayed where we were for about half an hour, until the town quieted down, and then slipped out. We didn't have any trouble getting back. Maybe the locals figured we wouldn't try anything more after the fuss Lak stirred up.

We didn't waste any time when we got back. We had no idea what might happen when the news of the night's action went up and down the local chain of command, and we had less idea how long the chain was. Whatever happened, we wanted to be as ready for it as possible.

Coryn went right to work on a power supply to furnish one hundred sixteen volt, sixty cycle A.C., and Rak, Tak, Lak, and Zak were already digging into the stuff Lak had brought back. I gave them what

I'd picked up and took two spear-throwers and went up and rigged out the two antennas we'd brought back.

We had beautiful, clear picture and sound reception of local signals an hour and a half after we brought the sets in the air lock.

There wasn't much I could do until Coryn, Rak, Tak, Lak, and Zak, got through with the stuff, but I stayed up until about an hour after dawn to see if the locals were going to do anything about Lak's unfortunate appearance in the town. They didn't do anything that they might not have done if they hadn't seen him, so I gave up and got some sleep. I rigged up the hypno-trainer and plugged it into the computer banks, so if I had to get up in a hurry I wouldn't have to waste any time getting shot full of the stuff they'd worked out while I slept.

I might as well have saved myself the trouble. The only change was that the monster bomber had been replaced by a much more normal eight-jet job, after sitting on us for twenty-three hours. The locals probably thought the jet constituted a "show of force." They could hardly know that their sleek jet, which was, of course, a tremendous technical advance over the monster, was a perfectly normal example of its type, which the monster definitely wasn't. The jet wasn't even important enough to wake me up.

I stretched my legs and switched the hypno-trainer over to conscious

operation, and plugged in again. They'd gotten quite a bit out of the receiver and the other stuff we'd brought back from town. Coryn had pretty well cracked the basic structure of the language, although she didn't have much on abstract concepts, of course. The Standard Methods for cracking a language in a hurry are inherently incapable of telling you much about anything non-concrete, but it would be possible now for me to carry on a reasonably intelligent conversation about where we were from, partly why, and what for, and it would be possible to explain our linguistic deficiencies and get co-operation in overcoming them. If they weren't too bull-headedly upset over it, it would be possible to explain Lak's appearance in the town.

There was little indication that their religion was tied up closely with their daily life. That would help; religions can be *so* abstract, and abstract-motivated actions can be *so* hard to understand or get explained.

One of the papers had been printed after we landed, and prominently displayed the pictures the photographer had taken of myself and the spear. There were also pictures of the photographer, the woman, the farmer, all the types of aircraft we'd seen, several military leaders who were apparently directing operations against us, and a handful of other people who seemed to have some abstract connection with us.

The news story that actually covered our arrival was brief and to the point. It described how we had been first discovered, the farmer's encounter with me, the woman and the photographer's visit, my actions, what the spear looked like, and what action was being taken against us. It seemed as if they were going to be perfectly happy to just sit and wait for us to make the first move, and be ready to clobber us if they didn't like it. Coryn's translations of some news broadcasts seemed to confirm this. It was all right with me. I would be perfectly happy to wait until I had a better command of the language and knew a little more about local habits and customs.

Most of the rest of the stuff about us was pretty much pure speculation, and a lot of it was wildly abstract. That was normal.

They didn't seem particularly excited about Lak's appearance in the town. Their descriptions of the incident, which we got through the receiver, were almost completely concrete and factual. They showed no real resentment, belligerence, or bitterness in spite of the violent action they took when they saw him there. It was almost as if people from spaceships rode into town on poles every day of the week and twice on holidays.

I relaxed and sat back and sopped up information as fast as they could dig it out, and waited.

I didn't wait as long as I'd expected.

Shortly before local solar midnight a small, low-powered aircraft approached at very low altitude, circled the spear once, and landed a short distance away.

The pilot got out, took a folding table and two chairs from the plane, and set them up under the wing. He drew his handgun and placed it in the center of the table and sat back and folded his arms across his chest. He was a short, stocky man with heavy eyebrows and a determined-looking face. His uniform was slightly different from that of the troops surrounding us, and he had stars all over his shoulders and a lot of silver symbols on his cap.

Zak said: "He's the commander of their air operations. Look; here's that picture in the paper." He handed the paper to me, pointing to the picture.

There couldn't be any doubt. He was the commander of the local's Strategic Air Command, and he was directing the air operations against us. I disconnected myself from the hypno-trainer and reached for my cape. "He sure picked an odd time to drop in on us," I said, "but I'm glad he decided to come to us instead of waiting for us to come to him." I got out a stun-gun and holster—offensive force must be noticed and matched—and buckled it on and went out the air lock.

We still hadn't found out what the proper local form of greeting was, so I tried the one the farmer had used, again. I walked up to the table, placed the stun-gun beside

his weapon, sat down, folded my arms across my chest, and said: "Why don't you go to hell?" This time I was more sure of the accent and inflection.

He smiled slightly and said: "Because, Satan old boy, I'm damn well not dead yet!"

How he found out my name—even though he pronounced it with an atrocious accent—I'll never know, but the important thing was that I'd found out that the greeting was a proper one, and what the proper reponse to it was.

After that, it was easy. He wanted technical assistance to produce a fleet of nuclear powered bombers capable of carrying a fusion bomb to any part of the planet and back, at about seven times the local speed of sound. In exchange he offered something he called his soul, which he

obviously considered quite valuable. I didn't know what he meant by it, but that didn't matter because technical assistance is always the first step in bringing a world up to Galactic Trading Status, and we're perfectly willing to give it to them free, if we must.

So I had him sign the standard contract, which he insisted on signing in blood, for some local abstract reason, and got him to promise to get me into contact with the other authorities on the planet. He said he'd do the best he could.

I watched him take off and fly away with a feeling of immense satisfaction. The worst was over. The Initial Intelligent Contact had been made, and with an unusual degree of progress and success.

This planet wasn't going to be so rough after all.

THE END

THE XVth WORLD SCIENCE-FICTION CONVENTION

The World Science-Fiction Convention genuinely is a *world* science-fiction convention this year; it is being held in London, England, on September 7, 8, 9, 1957. It's a little late to start arrangements to go . . . but if you're vacationing in the area this fall, get in touch with Roberta Wild, Secretary, 204 Wellmeadow Road, Catford, London, S. E. 6, England.



THE REFERENCE LIBRARY

BY P. SCHUYLER MILLER

THEY SAY...

Let's face it: what *really* annoys us is when "they"—those schmoes who know not SF—ignore science fiction. Praise we can take, and when we hear it, it's proof that there are some intelligent Joes out there, after all. Attacks we can rise against in wrath of the first water—firewater, anyway—and drive off in a flood of hard words, or ignore as beneath our dignity if we're the quiet type. But no comment at all is the outrage among outrages!

Fortunately for our peace of mind, the last few months have seen a series of discussions of science fiction in "outside" journals, called to my attention by friends and readers such as Berkeley's knowing Norman Metcalf, or stumbled over in the course of my own wanderings.

First in line was the February *Bulletin of the Atomic Scientists*, with an article by Arthur S. Barron, sociologist of the Research Institute of America, called "Why Do Scientists Read Science Fiction?" Next, in the Winter 1957 issue of the quarterly

Partisan Review, was Robert Plank's "Lighter Than Air, But Heavy As Hate"—which on the cover is called, more directly, "Space Travel and Psychotic Fantasy." Finally, April 27, 1957 *Saturday Review* our own good friend Poul Anderson inquires: "How Social is Science?"

Both Barron and Plank are writing, or think they are writing, about the kind of science fiction John Campbell has established as typical of *Astounding*, and about the kind of readers you are. Barron, for example, speaks of "recent surveys" which show that scientists and technicians are the majority among regular science-fiction readers. I have heard of no really recent survey of the kind—I think I would have, through *Fantasy Times* if in no other way—and I am fairly sure he is talking about the survey of the readership of *this* magazine, conducted several years ago. It is certainly not true at all of many of the magazines now being published, or of many of the newer paper-back books—yet, as Norman Metcalf pointed out when he told me about the article, Barron seems to have based his study on eighteen Ballantine and one Bantam pb's.

Plank, whose background I don't know but who seems to be a literary type, is talking about the same kind of readers: men from their teens to the early 30's and 40's with urban background and an average or higher education—students, technicians and "ambitious fellows who feel that they are the new middle class." Recognize

yourselves? I think it may be a fair picture of the so-called ASF type, but he certainly has never looked at fans in convention assembled! Incidentally, I don't know whether to blame Barron or the Atomic Scientists' proofreaders for such boners as "Assimov" and "Poolc" Anderson.

I won't go along with them on every detail, but qualified as commentators or not, both men seem to me to make sense. Let's agree that they are talking about us and about our kind of science fiction, and see what they have to say.

To Arthur Barron, scientists are reading science fiction not for escape, and not as great literature, but because its themes and treatment of them fill certain needs which present-day scientists have:

"... The scientist reads science fiction because of the close identification with his own work and problems which it provides," he states. "This identification is intense. It is such because science fiction serves at least three personal functions for the scientist. First, it glamorizes him. At a time when the intellectual in general, and the scientist in particular is regarded with some ambivalence, this is a most important function of the literature.

"Second, science fiction expresses the scientist's protest against the use of his knowledge for antihuman ends. This is important, too, since major difficulties surround any more open show of protest.

"Finally, science fiction reaffirms the basic humanistic values of the scientist's creed."

I am inclined to agree with Barron's conclusions without accepting all his reasoning as valid. Scientists *are* our heroes—and our even more impressive villains. I think the naivety of the author is clear when he assumes, in citing Fletcher Pratt's "The Undying Fire" to bolster his "glamor" argument, that the captain of a spaceship has to be a scientist—which the story's Paulsson wasn't. I suspect that some of the other hero-types he considers scientists, in the nineteen pb's he has read, are nothing of the kind. But it's true, within limits, that in the kind of SF this magazine represents, scientists have quite regularly been shown as "philosopher-kings," "rescuers of Man," and wielders of "great power."

"The special theme of science fiction," he says, "is that *human intellect, come to its finest flowering in the scientist, will save mankind!*" The italics and punctuation are his own, and as I've said in other connections, I think the italicized section—minus its central clause—probably is "the" tenet of science fiction, if there is only one.

Point two: the scientist finds that science fiction expresses a protest against society that he dare not voice himself, and identifies himself with it for this reason. "In a society which finds the scientist powerless in relation to the state and military . . . and

often the target of periodic waves of anti-intellectualism, the image of the scientist as powerful and dominant provides welcome salve to the ego."

Well, it's a major element in SF—but Barron doesn't know that this protest goes way, way back beyond the A-bomb and World War II. Maybe scientists didn't read it then, before they got their guilt-compulsions.

Just about all the SF readers I've met have been mavericks and individualists, so it may be that the argument not only holds but goes a step farther—we all want to revolt against any kind of regimentation, political or military, and let the stories do it for us.

But, says this sociologist, "science fiction is not a pessimistic literature. Implicit in the act of protest is the affirmation of basic values . . . a major feature of the literature." He names some of them: orderliness of the universe . . . supreme importance of intellect in solving human problems . . . universality of science (a point around which Poul Anderson's article is written) . . . endurance and perfectability of Man . . . emphasis on religious and spiritual values, and on the breaking down of false barriers between faith and science. He is about the first intellectual, looking on us from above, to discern this very fundamental affirmation of values which is so strong as to have become almost a set of clichés.

Barron closes with his own pre-

dictions of the future of SF. He's not very hopeful of our achieving much literary worth. Glamorized characters, he points out, are usually cardboard. Protest literature is apt to be propagandistic and shallow. Literature which stresses the reaffirmation of basic values can't avoid triteness and sentimentality—the clichés I just pointed out. What's more, he thinks a change in society will destroy the whole purpose of science fiction and wipe it out, since real peace will eliminate the need for protest, real status for scientists will eliminate the need for glamorizing, and the possibility of speaking out in public destroys the need to do it vicariously in fiction. Personally, I suspect that in any society these needs will exist for someone, if not for the scientists.

Robert Plank and Poul Anderson have enough to say, that I'm going to give them the benefit of next month's column, rather than try to squeeze them in here. Look up both articles in the meantime, if your library has these magazines.

THE MASTER, by T. H. White. G. P. Putnam's Sons, New York. 1957. 256 pp. \$3.50.

I must be hard to please, because most of the main-line critics and reviewers seem to be in ecstasies over this Mad Scientist frolic by the author of that really great fantasy, "The Sword in the Stone." As for me, I

hope he's not too fond of it. There are all sorts of nice bits and pieces, as you'd expect, but that's about the extent of it to anyone except the 93.268% of the public who have never read any SF or fantasy and consequently have no standards.

Rockall, let it be said, is a real island midway between Iceland and Ireland. "Island" is giving it too much credit, really: it's a rock, seventy feet high and about twice as much across, just poking its top out of the North Atlantic. For the sake of the story, which follows a pair of twelve-year-old twins, the rock has been hollowed out by a one hundred fifty-six-year-old Super-Scientist who lives inside with a modernized Fu-Manchu, a near-moronic mathematical wizard, a de-tongued old Negro, and an assortment of mesmerized technicians. The children have been snatched inside, with their dog, and fortunately not killed. The Master intends to rule the world or wipe it out. Mr. Blenkinsop, the Chinese henchman, is an accomplished double-crosser. And the old gent with the crackle finish can delve into and control the minds of everyone but young Nicky and mute old Pinkie.

Watch for it in the remainders.

THE DEEP RANGE, by Arthur C. Clarke. Harcourt, Brace & Co., New York. 1957. 238 pp. \$3.95

On one thing the prognosticators of our future are agreed: to keep on

ASTOUNDING SCIENCE FICTION

living comfortably for very many more generations, Mankind is going to have to live off and out of the seas. Since Arthur C. Clarke is as much at home under water as he is in a space station, on Mars, or beyond the last stars you can see from Palomar, it is not surprising that he has now made this submarine world his own.

You may recognize the opening pages, which I believe were published here as a striking short story a few years ago: they describe a warden in his one-man submarine, riding herd on a pod of whales and protecting them from the predators of the deep. The whole book might have been done excitingly and enthrallingly along these lines—but Clarke never does the obvious. Instead of the melodrama of the *Deep Range*, he gives us the quiet drama of a man—nightmared out of the spaceways—who rises from apprentice warden to administrator of the whole Marine Division. There's plenty of action—in the hunt for the Sea Serpent that they don't quite find—in the capture of the kraken that has been trapping their sperm whales. But you also come to understand the practical problems of this world-to-come: whale-milking versus whale-slaughter as the chief source of food—whales versus algae as Man's best hope — personalities, politics, hopes and fears.

This fits with "Prelude to Space" and "Sands of Mars" among the "documentaries" that Arthur Clarke has made all his own.

UNDERSEA FLEET, by Frederik Pohl and Jack Williamson. Gnome Press, New York. 1957. 187 pp. \$2.75

In contrast to the quiet realism of Arthur C. Clarke's "Deep Range," this Gnome adventure yarn for teen-agers, sequel to "Undersea Quest," uses all the tried and trying elements of the traditional sub-sea story, and admittedly uses them quite well on its level. We have, again, a future world living off the sea, but it is a blatantly fictional world and never one in which you can imagine yourself swimming with a face mask and flippers. The Sea Serpent is here, but he has become a plesiosaur living in the great deeps, and he has men and girls riding him—amphibianized descendants of the Polynesians, we're told, who must have been converted by a super-Lysenko process from men into near-fish, complete with gills, in a couple of thousand years. You have a treasure in fabulous Tonga Pearls at stake—the stampede of the dinosaurs—the attack of the half-men—just about everything you could have. All this puts the story closer to one of the Winston juveniles than to Heinlein's superb books for Scribners, and a notch below the first of the series.

SLAVE SHIP, by Frederik Pohl. Ballantine Books, N. Y. (No. 192) 1957. 148 pp. \$2.75 & 35¢

There was no information slip in

the copy of this book that Ballantine sent me, but Steve Takas says there's a hard-bound edition as well as the usual paperback. The serial was in *Galaxy* last summer, and the title is misleading. Our hero, Lieutenant Logan Miller, is training a crew of animal "slaves" to sail a ship in the West's barely boiling war with the Caodai, militant missionaries of a Southeast Asiatic religion. But the ship and its voyage are quite negligibly involved in the action of the book.

The satire here isn't as broad and jagged-edged as in some of the Pohl-Kornbluth collaborations, but it will do quite well. The Navy, being short of expendable humanity, is training men to talk to animals who in their turn will be trained, persuaded and ordered to perform military duties for which you can't hardly get Seamen and PFC's. Miller's wife is a Caodai prisoner in Zanzibar, though he can communicate occasionally by telepathy through a licensed esper who may or may not be an enemy spy.

There's a thoroughly nasty plague going the rounds, affectionately known as "the Glotch" by people who haven't had it. There's a beautiful Intelligence agent—and in due course there's a sneak expedition to investigate and knock out the prime enemy base on Madagascar.

It's fun, it's new, it's smooth, and why does it have to be Literature to get your cigarette money this week?

ACROSS TIME, by David Grinnell.
Avalon Books, New York. 1957.
223 pp. \$2.75

I'm told by my betters—at least, by better-informed readers who still manage to keep up with all the magazines—that previous books in this Avalon series have been condensed rather than expanded from the original magazine versions, to fit a standard format of fourteen 16-page printer's forms. Be that as it may, they all have 224 pages and the publisher does not credit the original sources, which presumably means that the story has been edited or rewritten enough to get a new copyright.

This is one of the minor entries in the lot I've seen so far. Captain Zack Halleck, tangled in textbook psychological compulsions, lets a flight of UFOs make off with his brother and his wife, Zack's one-time girl friend. Presently he is snatched into the far future, and finds himself guest of a humanity that has forgotten the Twentieth Century ever existed.

Tangled in local politics and ideologies, Zack heads for a taboo area in the far north, finds the real descendants of his kind, and sets out with the help of the Good Globes to rescue the kidnaped pair from the Bad Globes.

From here in it's a rather matter-of-fact variant of the kind of space-doings that Doc Smith and Edmond Hamilton once had almost entirely to themselves.

MAN UNLIMITED, by Heinz Gartmann. Pantheon Books, New York. 1957. 214 pp. \$4.50

The author of this book is a journalist and rocket researcher who seems to be in close touch with current experimental work all over the world, or at least over its Western fraction. However, too many other writers in this country have been in the field before him to give his book the importance it would otherwise have.

Dr. Gartmann's theme is the fragility and durability of Man himself, in a world of speeds and forces which at the same time stress him beyond his power to respond, and make his power of decision all the more important.

This is the area Space Medicine is exploring—the author's subtitle calls it "technology's challenge to human endurance," and he explains step by step what we are doing to measure, define, and extend what Man can and must do: against crushing accelerations, against oxygen deficiency, against explosively released pressure, against fatigue and the dislocation of habitual time-schedules, against noise and heat and radiation and a host of other hazards.

He closes with some thoughts on where the robot fits into this human obstacle race, and where it can never fit.

If you haven't already been reading up on this field, this is a very good place to begin.

THE SHORES OF SPACE, by Richard Matheson. Bantam Books, N. Y. (No. A-1571) 1957. 184 pp. 35¢

There are thirteen stories in this collection by one of science-fantasy's more spectacular young talents ("I Am Legend," "Born of Man and Woman," Hollywood's "Incredible Shrinking Man"), and I think they add up to a better, less derivative book than his first one. In these stories, most of them, there is very little trace of Ray Bradbury. This is "R. Matheson—His Book."

By the same token, it's an unrelievedly grim set of adventures in time and space, some of them open fantasy. The "Being" of the opening story is stranded on Earth, feeding on as many men and women as its possessed instrument can trap for it in the desert. In "Steel" a pair of desperate promoters try hopelessly to get their decrepit robot fighter into the ring—and find an even more hopeless way of solving their problem. In "The Test" we watch an old man preparing for the examination which will mark him for execution or life in an overcrowded world. "When Day is Dun" gives us an insane poet as the last man on Earth, and "The Last Day" treats the same theme with equal certainty that Man is vile.

There is humor here, too, but even it has that acrid tang to it. In "Pattern for Survival" the last man is twisted wryly and effectively for a third time. "The Doll That Does Everything" shows us a creative pair

who have created once too often, and are looking for an easy way to neutralize the venomous brat they have produced. Then, in "The Funeral," we have the mortician who finds himself profitably involved with as macabre a collection of ghouls, warlocks, witches and vampires as ever spun around Bradbury's typewriter in the early days. "Clothes Make the Man" is a fantasy that would probably have shone in *Unknown* if Matheson had been writing then, and "Blood Son" introduces the little boy who wants to grow up and be a vampire—Bradbury again.

"Trespass," the longest story in the collection, builds up the old, old situation of the young husband who comes home after years in the jungle to find his wife pregnant—but very strangely pregnant.

"Little Girl Lost" is a beautifully done little tale about the child who steps through one of those holes into nowhere and can be heard crying there. And, finally, in "The Curious Child," we have that man who begins to lose his past, his present, his self.

It's the best short story collection I've seen in the first quarter of 1957.



ASTOUNDING TALES OF SPACE AND TIME, edited by John W. Campbell, Jr. Berkeley Books, N. Y. (No. G-47) 1957. 189 pp. 35¢

This is the second selection from the "Astounding Science Fiction An-

thology": seven stories which originally appeared here between 1940 and 1951. If you remember the complete book, which you should have, it was a fat collection of good stories, though nobody pretended they were the best John Campbell ever published. Most of the choicest titles had been picked up previously by other anthologists, and like any good editor, John insisted on preserving balance.

If you don't have the full collection, however, you shouldn't pass these excerpts up.

What are they? First, Eric Frank Russell's "Hobbyist," with a man and a parrot on a very strange planet. Then Jack Williamson's "Hindsight," a story of time and space war.

Third, Theodore Sturgeon's now fairly famous "Thunder and Roses," full of beauty and bitterness. Fourth, T. L. Sherred's "E for Effort," which considers some of the possibilities and problems involved in a device which can look and listen at anything that has ever happened, anywhere, anytime.

Russell has the fifth story again: "Late Night Final," in which the supermen of Huld find certain difficulties in subduing Earth. Then H. B. Fyfe, in "Protected Species," considers some of the problems of identifying an alien master-race, and Murray Leinster closes the book with his "Historical Note" about the Russian military secret that blew up with a fizzle.

They're all good.

THE FIRST WORLD OF IF, edited by James L. Quinn and Eve Wulf. Quinn Publishing Co., Kingston, N. Y. 1957. 160 pp. 50¢

Certainly *If* has as much right as *Astounding* or *Galaxy* or *Fantasy and Science Fiction* to publish an anthology of top stories from its first five years. For the good of your pocket, it's a paperback collection.

There are twenty stories here, by writers you know and others you may not know. If you haven't read the magazine that has been earning itself a place up here with the best, by all means let this be your introduction. Horace B. Fyfe opens, for example, with a delightful little thought on the ultimate uses of self-perpetuating robots, "Let There Be Light." Frank Riley has "The Cyber and Justice Holmes," which is quite properly in the latest Dikty "Best" volume. James Blish, in "Water-shed," has one of the episodes in the novel that's due any day now from Gnome—now being the end of March. Isaac Asimov's "Franchise" is a pleasant little reflection on the direction in which polls, surveys, ratings, and indexes are taking us. Jerome Bixby's "Laboratory" is unearthly slapstick, and Edward R. Ludwig's "The Drivers" is shiveringly probable as some of Fritz Leiber's previews have been.

Most of the stories are quite short. There's so much variety that I won't name a favorite, and you may not remember them very long, but you should enjoy most of them.

WHO SPEAKS OF CONQUEST? by Lan Wright.

THE EARTH IN PERIL, edited by Donald A. Wollheim. Ace Books, N. Y. (No. D-205) 1957. 160 + 158 pp. 35¢

Ace is marking time on this one, which combines a space-conquest novel with a conquest-of-Earth anthology. The book is the one in which Mankind, exploding into Space, finds that the galaxy is already owned—by an empire of assorted space-roving races dominated by the worldless beings from Rihnan. By snapping their fingers rapidly—or so it seems—Earth's military and scientific geniuses capture an enemy ship, discover the secret of its weapons, find invulnerable defenses, and head right on out to take the universe away from the Rihnan. And there's a kicker with an awfully strange resemblance to the big secret behind the "Lensman" yarns, except that Doc Smith makes his unbelievable goings-on pretty nearly believable, and Lan Wright just fills in the formula.

As for the Wollheim anthology, it's a kind of companion to his "End of the World" collection for Ace: six stories stretched from 1899 to 1954. The old classic is H. G. Wells' "The Star," the very short cyclorama of the havoc wrought by a passing star. The new one is Bryce Walton's "Mary Anonymous," with a Martian-controlled chimpanzee trying to sabotage our blow that will wipe out life on the red world. The

longest is Murray Leinster's "Things Pass By," pure entertainment done with the master's best and most impressively effortless smoothness. One of the shortest is A. E. van Vogt's "Letter from the Stars," in which Skander of Aurigae II doesn't quite get what he has been fishing for. Then there's C. M. Kornbluth's "The Silly Season," in which wave after wave of alien nonsense finally adds up, and another old one, Edmond Hamilton's "The Plant Revolt," dated 1930—and dated.

REPRINTS IN PAPER COVERS

A couple of readers who have tried to order paper-backs directly from the publishers tell me that you have to know the stock number, or the order won't be honored. I'll try to include it hereafter. Some publishers are also tacking on a handling charge: which and when you'll have to puzzle out for yourselves, as policies seem to change overnight.

PERELANDRA, by C. S. Lewis. Avon Publications, New York. (No. T-157) 1957. 191 pp. 35¢. This is the second of the three books in this theologian's allegorical series. It began with "Out of the Silent Planet," Avon T-127, an excellent interplanetary adventure with a Martian setting in which the philosophy interfered very little with the color and the story. Now the battle between Good and Evil is transferred to

Venus, and the mystical-fantastical element gets quite a bit stronger. I don't know whether Avon intends to go all the way and publish the third book, "That Hideous Strength," in which they all come back to Earth and resurrect Merlin.

FACE IN THE ABYSS, by A. Merritt. Avon Publications, N. Y. (No. T-161) 1957. 253 pp. 35¢. You like Merritt or you don't, it seems: this is one of the most colorful of his lost race books, with the Snake Mother, Kon the Spider Man, assorted lizard men and flying dragonlets, and the Face that drools gold.

THE POWER, by Frank M. Robinson. Bantam Books, N. Y. (No. A-1593) 1957. 181 pp. 35¢. One of the best of the Superman stories.

THE SYNTHETIC MAN, by Theodore Sturgeon. Pyramid Books, N. Y. (No. G-247) 1957. 174 pp. 35¢. In 1950 this was called "The Dreaming Jewels," and I think it was Sturgeon's first book, previously run in *Fantastic Adventures*. The book opens with Horty, the boy, eating ants and catching hell for it. Later he finds that he has the power of regeneration. Then there are the carnival people, and of course the Jewels. It's one of the strangest things he's done, though not his best—he hasn't written that yet, of course.

THE END



BRASS TACKS

Dear Mr. Campbell:

Thank you for your letter of May 29th and following are details of the 1957 World Science Fiction Convention:

Membership Fee, \$1.00: Payable now. This entitles members to votes, journals, program booklet, et cetera.

Entrance Fee, \$1.00: Payable now or on arrival at the Convention.

Special Lunch arranged by the Committee: \$1.50 per head. This will be held on Saturday and arrangements are being made for a number of well-known personalities to be speakers at the lunch.

Hotel: \$2.85 bed and breakfast. Lunch 80 cents approx. Dinner 90 cents approx.

With the exception of the membership and entrance fees, prices quoted above are, of course, liable to fluctuation, but this should not

be more than a few cents. The hotel is now fairly full, but arrangements have been made with the manager that other hotels in the same street will be available for accommodation. In any case, members will have access to the King's Court Hotel at all times.

Friday will be mainly registration and introductions will take place in the evening. Saturday will commence with the special lunch and will be mainly for the professional side of science fiction. There will be a costume ball in the evening which will be covered by Pathé Pictorial. Sunday will be a light-hearted day for the amateurs, but there will also be a special film show, for which arrangements are now in hand. Monday will be for business sessions and farewells.

All bookings must be made through the Secretary. Membership

and entrance fees may be sent to me in the form of dollar bills or international money orders, but not by check as the banks charge an enormous fee for changing the checks. Franklin M. Dietz is collecting fees from Americans, if they prefer not to send money out of the country, and he has opened a World Science Fiction Society account with the Emigrant Industrial Savings Bank, 5 East 42nd Street, New York, for this purpose. Applicants for membership who wish to pay by check—or in dollars—should send the fees to his address at 1721 Grand Avenue, Bronx 53, New York. Information may also be had from him concerning the chartered plane trip. —Roberta Wild, Secretary.

The World Science Fiction Convention.

Dear John:

As Harry Stubbs has probably found from the second instalment of "Get Out of My Sky," his conclusions about the solar system in the story did not quite jibe with what I had intended. Nesmet is not sixty million miles farther *out*, but farther *in*; it is a small planet, about the size of Mars, circling the primary at about 40 million miles, in a highly inclined orbit. The twins, which are each only slightly smaller than the Earth—about 7000 miles each—are about 100 million miles from the primary. This in turn effectively doubles the mass of the red

dwarf star in the Trojan position; it also doubles the mass of Gao, the fifth planetary body, stated in the story only as twice the size of either of the twins.

Given in the story also is the diameter and distance of the "nearest satellite of planetary size," 3,900 milcs through, circling a primary 85,000,000,000 miles from the white sun; not given in the story, but possibly deductible, is the diameter of this primary, which is about 100,000 miles. There are also some other outer planets which I didn't have occasion to mention; the whole system bears a faint resemblance to a light-weight atom, with the white primary, Nesmet and the three Trojan bodies forming a sort of nucleus, the other planets very much farther out; Gao is the innermost of these.

This whole system, by the way, was a "given" as far as I was concerned—it was designed by Willy Ley as a basis for one of the late Twayne Triplets, which were books containing three short novels by three different authors, but all based on the same background supplied by a fourth man—or sometimes two. In this instance the geological and biological layout of the Twins was supplied by the late Fletcher Pratt.

Any goofs committed with the material, and of course the story itself, are my responsibility. (And that spindle-shaped eclipse shadow Harry points out is assuredly a goof.)—James Blish.

And now it's Hal Clement's turn!

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Dear John:

As you and most of your readers know, I am not exactly a chauvinist—being in fact classifiable under Egghead, One Worlder, and such epithets. However, when anti-Americanism on the childish level of W. P. Witcutt's letter in the May ASF shows up, somebody has to do a hatchet job, and Sprague de Camp may not find the time.

Witcutt says, you recall, "Science" and "Democracy" are things of Europe, and however much lip-service Americans may give to them, in their hearts they hate them." Referring to the story "Witches Must Burn," he says: "Put the story in a European setting and it is completely impossible in any conceivable future." He concludes that anti-intellectualism and in fact the whole apparatus of totalitarianism is naturally American, that we are simply evolving along lines laid down for us in our distant past, and that European society is something quite different and rather nobler. In proof he cites "the report on America given by that highly intuitive genius D. H. Lawrence and the prophecies of that most intuitive of American poets Robinson Jeffers."

Hm-m-m, now. Seems to me that the most "intuitive" people have, by definition, been those who relied least on their conscious minds. Lawrence was not exactly friendly to science, as Witcutt might learn by taking the trouble to read Lawrence. Jeffers predicts that not just us, but everybody, is due for a heavy dose

of Caesarism, and that we in fact are more likely to be the prey than the conquerors, being "not aquiline Romans but soft mixed colonists" if I remember the line rightly.

If I wanted to cite a foreign report on America which arrived at other conclusions, I could start with Tocqueville and work on up. But let us find a few fascistic native-American quotes . . . let's see . . . Jefferson: "The tree of liberty must be refreshed from time to time with the blood of patriots and tyrants." No? "I have sworn upon the altar of God eternal hostility to every form of tyranny over the mind of man." Odd; I can't seem to verify the Witcutt thesis from Jefferson at all. Let's try Lincoln . . . no, maybe not.

Having had little luck with proving that America is naturally despotic, we should at least be able to quote from some eminent Europeans to prove that anything but peace, democracy, and science is "completely impossible in any conceivable future." A few comments by Europeans, then, on their own civilization:

"The Republic does not need scientists."—Robespierre

"God is on the side of the largest battalions."—Napoleon I.

"The dictatorship of the proletariat."—Karl Marx

"This policy . . . can only be carried out through blood and iron."—Bismarck

"When I hear anyone talk of

Culture, I reach for my revolver."
—Hermann Goering

As a matter of fact, from the viewpoint of the American, who has managed to unify half a continent at the price of only one full-scale civil war and that nearly a hundred years ago—and who has lived peacefully with his Canadian neighbors since 1814 and foresworn southward aggression for the past couple of generations despite frequent severe provocation — from the American viewpoint, I say, Europe looks rather like a kennel of mad dogs who try to kill each other as soon as the wounds of the last free-for-all have begun to heal. The wonder is not that the American occasionally speculates on whether it's worth the trouble, but that he keeps on patiently spending his money and his sons to break up these periodic suicide attempts.

For his reward, he is told by European intellectuals to go home before his no-good culture of jazz and chewing gum corrupts the True Civilization. Being the oaf he is, the American makes no reply, does not even ask the humble question: "Why do your kids go in so heavily for jazz and chewing gum if the True Civilization has so much more vitality?"

O.K., I've got it off my chest. Of course I have taken a radical position; approximately as radical as Witcutt's. In all seriousness, as regards both Europe and that transplanted piece of Europe called America, I shall end with one more

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quote: "We must indeed all hang together, or, most assuredly, we shall all hang separately."

Or maybe with a distorted quote: Let's not fail to see the beam in the Soviet eye for the mote in our own.
—Poul Anderson.

Let's try maybe a third viewpoint. There can be a destructive excess of anything—including democracy. The hatred of the Egghead, the anti-intellectualism, which does in observable fact exist in the United States, might be the result of an excessive demand for democracy. To impose equality of achievement on all individuals is itself tyrannical; equality of opportunity to develop does not exist if a ceiling is imposed on the extent of the individual's development. Europe, because of its tradition of nobility and commoner, is less opposed to differences of achievement—but Europe, unfortunately, and I hold improperly, imposes difference of opportunity for education and self-development.

Dear Mr. Campbell:

Here are my An Lab ratings for the May issue:

The Dawning Light III; by George, I liked that story.

What's Eating You? I can almost see this happening.

Something in the Sky.

The Queen's Messenger. This one didn't quite have the "reality."

In quite a few of the SF stories floating around presently I have noticed the following: (young Dr. Killvillian is explaining some invention) "... You know, of course, that all inventions start on simple principles with complicated construction, then more complicated principles are discovered but the machine is simpler in construction." To give an example they usually cite transportation, the cars of the beginning of this century, the cars of today, and then the rocket. I disagree with this, I'll admit that this sometimes happens, but just the opposite has happened in this century.

Let's take transportation, the automobiles of the 1900s worked on the same principles our contemporary ones do, these early cars were made as simple as possible, i.e. carriage bodies, one-cylinder engines, no self-starter, et cetera. Now, compare this with our "simple" little land-monsters. To go a little farther with the automobiles, later machines are supposed to be easier to operate, I defy anyone who learned on a pre-1915 car to drive one of post-1925 vintage—push-buttons or not. Finally, for the rocket, according to Killvillian this is complicated in theory and simple in construction—hah! The rocket works on one of the simpler laws of nature—action/reaction. As for uncomplicatedness in construction, has anyone seen the insides of a Viking or V2? Even with an atomic rocket I can't imagine one without all kinds of safety devices and instrumentation.—Larry Can-

trell, 135 Capp Street, Apt. # 1, San Francisco 10, California.

You have a point . . . but don't forget that in modern cars we have not only transportation function, but also radio entertainment, air-conditioning, and various gadgets to compensate for the thick-wittedness or mechanical ineptitude of the driver!

Dear Mr. Campbell:

Your article in the May issue—"But . . . I Measured It"—has made me break a long silence.

What you do measure is not megavolts, or microamperes, or flux density, it is merely the distance that a pointer moves on a graduated scale. Measure mass or weight and you measure the distance a pointer moves on a graduated scale or the distance a spring compresses or stretches. Measure volume and you measure the distance a liquid rises in a graduated tube. Measure light intensity and you measure the distance a pointer moves on a graduated scale, or perhaps the distance you must place two sources of light from a card to have equal illumination. Measure temperature, and you measure the distance a pointer moves on a graduated scale or the distance mercury rises in a tube. Measure *any* physical phenomenon, and you eventually wind up measuring a distance. And it is interesting to note that all these measurements depend on the

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distance between two scratches on a metal bar in Paris.

In one of my popular talks, and I cover the field from science to religion, I point out that the smallest unit of distance is the Fermi, 10^{-13} cm., used in measuring nuclear radii. The largest is the light-year. The ratio between the two is approximately 10^{31} . A distance of a little over 10^{11} " is halfway between; that is, there are as many Fermi in this length as this length is contained in a light-year.

Now—as regards the long silence. I am a charter member of science fiction. I started with the April 1926 issue of *Amazing*, switched to *Astounding*, and have yet to miss a copy. Same with *Galaxy*. I read my first science fiction circa 1915, Wells' "Time Machine." I read Ray Cummings, Wells, Gernsbeck, E. E. England, and many others whose names I have forgotten.

While I like the present crop of writers, I still think that Skylark Smith and Hamilton are all-time tops. I still read them with pleasure.

No, I do not keep back copies, there's just not enough space available, not hours in the day if I did that. Nor do I belong to a fan club.

I am a research chemist with Deering Milliken Research Corporation. As I said I also give a series of popular talks, charging where I can, but gratis to some organizations.

How about some of us old-timers starting a Charter Members Club; no dues, fees, constitution, meetings,

and only one rule-eligibility. You must have an unbroken record of *Amazing* and *Astounding* from April 1926.—Francis Marion Sell, Bailey Court, 11-1, Anderson, South Carolina.

I guess I'm a Charter Member, too.

Dear John:

I'm five years behind on all my correspondence but I have to take time out to put in a super plus shriek of joy for "Nuisance Value." I just reread it and I loved it as much the second time as I did the first. THIS, amigo, is SCIENCE FICTION+. In fact + + + +. It was fun, and fun is what the whole field has been rather sadly lacking in lately. I haven't quite decided why, but I have a vague hunch that it has a lot to do with character involvement. There is a tendency for the writer to get so involved with his idea that his characters become mere passive chess pieces. And while there is a definite intellectual enjoyment in following the workings of a new concept, this in itself is not enough. In "Nuisance Value" I got involved with the characters, as a result that was a sense of participation that I don't get too often any more.—Theodore R. Cogswell, University of Kentucky.

As you know, Ted, wanting to write—or to buy!—good humor isn't equivalent to being able to!

(Continued from page 7)

ing to instruct the student in something which is solidly rejected, blocked, and denied by a previous subconscious education. But the student does not, and never did have, any conscious knowledge of that blocking pattern!

The idea that someone can learn something that neither instructor nor student were, at any time, consciously aware of may seem a bit far-fetched. The demonstration of the fact is simple. Linguistics makes a first-rate area for examination of the problem—partly, for one thing, because it can be shown that it does exist in the area of linguistics, and partly because it is self-evident that no animal experiments will be adequate to study the problem. Animals can't be taught to speak. (Parrots make noises; so do magnetic tape recorders. Neither learns human speech.)

Linguistic studies have shown, in the past twenty-five years or so, that there is, in each of the major languages at least, a quite definite formula for the construction of monosyllables in that language. Basically, of course, in any language a monosyllable will have a generalized formula Ci-V-Ct, where Ci stands for an initiating consonant, V for a vowel, and Ct for a terminating consonant.

In a particular language, Ci will be limited to a certain range of possible consonants, while Ct will be limited to a certain different selection. In English, the consonant *p* can

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appear either as initiant or as terminant, as in *pop*, *pip*, *pep*, et cetera. The consonant sound *ng*, however, can appear only as a terminant; the consonant sound *fr* only as an initiant. Thus the monosyllable *ngofr* cannot be an English monosyllable—although both the consonant *ng* and *fr* are common, fully acceptable consonants in English. *Frong*, however, would be perfectly good English. It doesn't happen to be used, but since it fits the English formula, it can be accepted readily.

Up to about twenty-five years ago, the existence of formulas of this type was not consciously known. The formulas have been investigated considerably since then; different languages have markedly different formulas. *Ng* as an initiant consonant, for instance, is acceptable in the monosyllable formulas of certain other languages.

The most interesting feature of this investigation, from the viewpoint of the present discussion, is that recordings have been made of the playing-with-words speech of four and five-year old children in various countries. Children amuse themselves, when they begin talking fluently, by making up their own nonsense words.

The slightly incredible fact is that the four and five year old children make up nonsense monosyllables that precisely and accurately comply with the linguistic formula of their own native language.

Evidently, the children have, already, learned the existence and

exact nature of a highly complex and thoroughly arbitrary pattern of behavior—which their elders, from whom they learned it, were entirely unaware existed! The children themselves, of course, are just as thoroughly unaware, consciously, of the pattern they are obeying. It took the painstaking research of highly skilled linguists to discover that that pattern existed—that is, to discover consciously, something that every one of them had, of course, been using since early childhood.

There's a simpler one of the same general nature. Robert Abernathy, the author—who is a linguistics specialist—called this one to my attention a few years ago.

In English there are two forms of the present tense; the "I gwam" form, and the "I am gwaming" form, to use a purely synthetic nonsense monosyllable verb as an example. (Yes, it complies with the English monosyllable formula.) Generally, grammar texts hold that the two forms are fully equivalent—but no English-speaker uses them interchangeably. By the time a child is six or so, he has learned the pattern of correct usage; he will not say "I walk," nor "I am seeing."

O.K.—there is a difference; the two forms are not interchangeable, and we all know it. You know it, and use it correctly. That is, you know it subliminally, and you have, if you have children, taught your children. But do you consciously know the difference? Do you have

a consciously expressable statement of the rule, the pattern, involved?

Which form would be correct for our hypothetical verb "to gwam"? Let's define "to gwam" as meaning "to perceive by some intuitive process," and ask which is correct: "I am gwaming this is the correct procedure," or "I gwam this is the correct procedure."

The pattern in selection of the form is one you can't defend logically—it's strictly an arbitrary, as arbitrary as English spelling, or that "tree" means what it does. You have been using the pattern of selection of verb forms for years—and never had conscious awareness of that pattern. You've even taught it to children around you—without at any point having conscious knowledge of it!

The rule appears to be that the "I gwam" form is used in the present tense for verbs concerning subjective action, while the "I am gwaming" form is used for verbs denoting objectively observable action. Thus "I see" is a subjective action, while "I am walking" is objectively observable. In the case of "I think" two quite different meanings exist; the "I think" form is applied to the subjective process, while "I am thinking" usually applies to something resembling the pose of Rodin's "The Thinker." "Go away, son; can't you see I'm thinking."

Like most great abilities, the ability of the child to learn something

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his parent isn't consciously able to teach has two sides to it; it's an absolutely necessary ability, obviously—yet it means that Junior is busily learning his parent's undesirable sub-conscious patterns, also. The patterns that Daddy wishes he didn't have, and has sternly suppressed in all his conscious behavior.

Daddy may, as a result, wonder how on Earth Junior learned the undesirable habits that he himself has been so carefully suppressing.

If conscious knowledge were all Junior learned, he'd never learn to speak correct English—let alone learn to understand the personality patterns of the people around him. He'd be the same sort of social moron that a modern computing machine is; lots of data—lots of logic—and a score of zero on what human beings call, rather vaguely, "human understanding."

Fortunately, just because you don't know it yourself doesn't mean that you can't teach it, and just because Junior never gets to know it doesn't mean that he hasn't learned it usefully, either.

But it makes things just a little difficult for the educational psychologist, and for the psychotherapist.

The psychotherapist may be looking for some good, sound logical-correlation pattern, some great traumatic incident, that caused the patient to manifest this peculiar behavior pattern. The death of a loved one—some great tragedy.

But it may be somewhat difficult to discover the actual process by

which the pattern was learned—when neither the patient himself, nor the parent from which he learned the pattern, at any time ever knew the thing consciously!

Incidentally, if you really like arguing, almost to the point of fighting, you can have fun with the Ballantine book, "I, Libertine," by "Frederick R. Ewing" — behind which whiskers can be found the bewhiskered face of Ted Sturgeon. It's a very curious book; the central character, Lance Courtenay, makes a wonderful starting point for hot debates. About ninety per cent of the men who read the book wind up with a strong conviction that Lance was a pretty good guy, in a tough spot. And ninety per cent of the women who read it wind up knowing Lance was a heel and a louse, and got the comeuppance that was long overdue. The most interesting part of the argument is that the women, for once, have the logic and the data—they can cite chapter and verse and facts—while the men have only "male intuition."

The gimmick is that the logic and data are 180° out of phase with the pattern—but let's see you find, and clearly demonstrate to someone else that the pattern is in fact there, and is in fact out of phase with the logic and facts!

It's there. Having sweat the blasted thing out for myself over a week or more, I won't spoil that fun for you.

THE EDITOR



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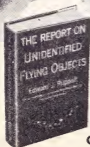
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